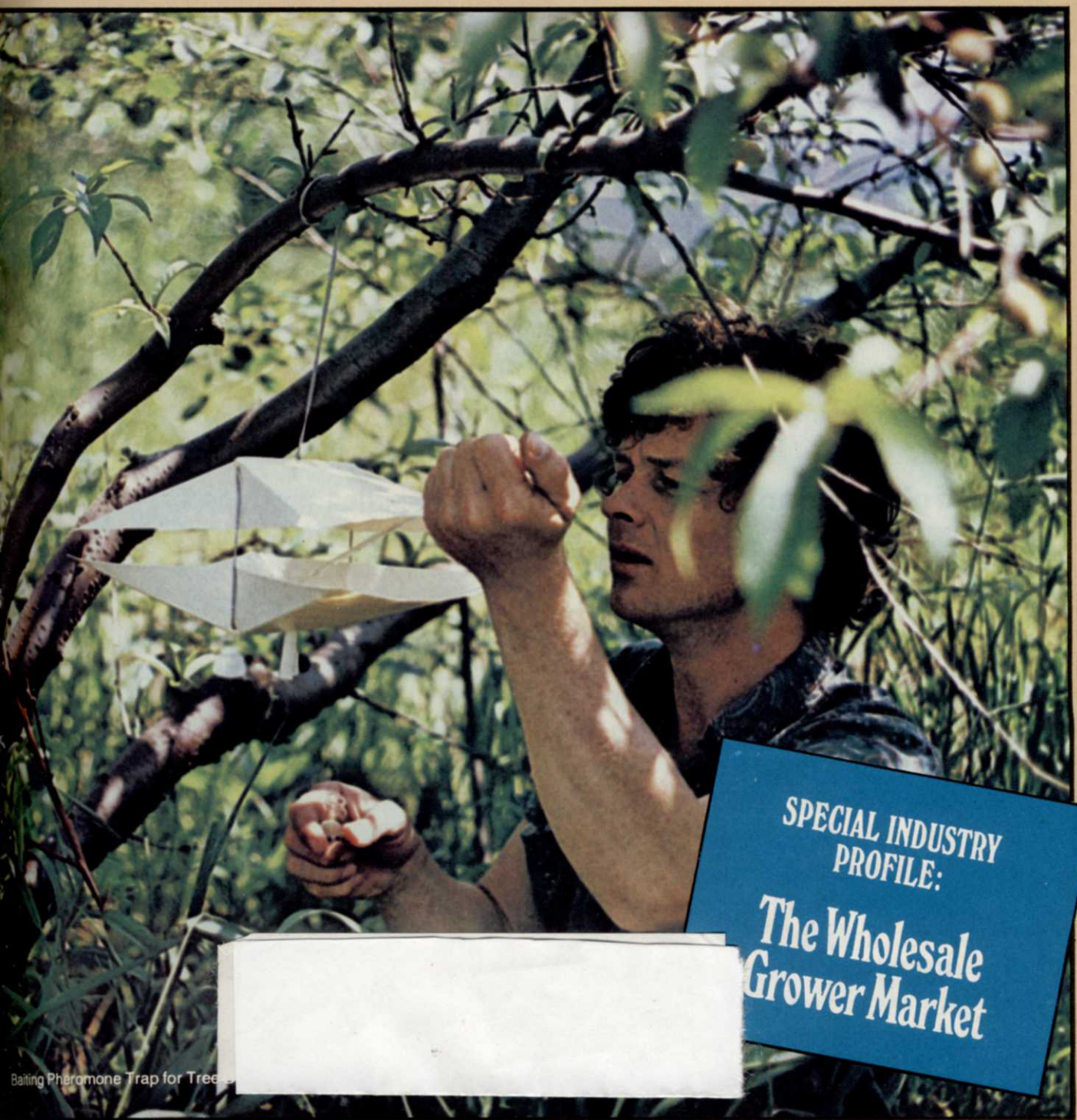
The Business Journal of Vegetation Management May 1978/$1.25

WEEDS TREES & TURF

Rights of Way: 1972-1978

All About Irrigation Controllers

Trapping Tree Borers With Pheromones



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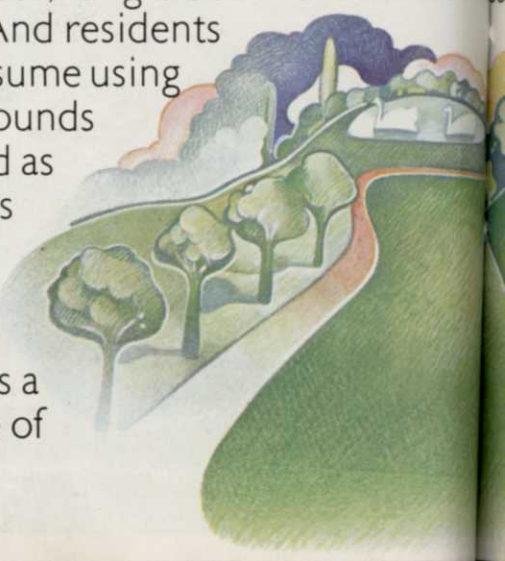

BACK.

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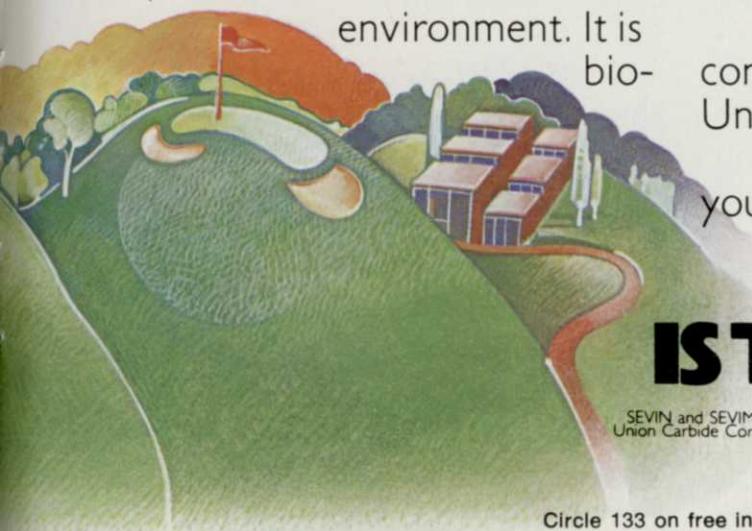

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WT&T

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VIEWPOINT

Bruce F. Shank, Editor

In April, I asked if you would let us know about your job promotions and awards. Well, I've got news about promotions on the magazine.

Ron Morris, who joined WEEDS TREES & TURF in May 1977, has been promoted to technical editor effective immediately. Ron is a graduate of Purdue University's turfgrass management and agricultural communications programs. He served under Dr. William Daniel and Dr. Ray Freeborg as a turf research assistant and is currently assisting in the production of their new book, "Handbook for Turf Managers," to be released this summer.

Ron wrote the major features on spraying systems and fertilizers that appeared early this year. He has attended numerous industry shows this year to familiarize himself with current research in all areas of the Green Industry. He will be responsible for constructing a central data bank of all applicable research taking place in the United States and in foreign countries.

By doing this we hope to quickly link your questions in the Vegetation Management and Proscape columns to the individuals doing the most up-to-date research on that particular topic. This will also shorten the period of time between research completion and publication of the informaiton for the persons in the field. This period is often six or more months and then the information is published in professional journals which the average lay person doesn't receive. Every person in public or private institutions performing any type of applicable research is now being contacted.

In other news, Scott Scredon, who is currently assistant editor of our publication GOLF BUSINESS, will join the staffs of WEEDS TREES & TURF and LAWN CARE INDUSTRY as assistant editor. Scott will specialize in the field of landscaping to improve our coverage of this vital area.

Finally, Bob Earley, the visible editor of LAWN CARE INDUSTRY, will advise me on happenings in his industry which effect the entire Green Industry. He will also represent WEEDS TREES & TURF at industry functions he attends. Since Bob was at one time editor of this magazine, he is very familiar with all aspects of the Green Industry.

What we are doing is organizing a group editorial office to serve all industries within the Green Industry. Each industry will get the attention it requires and needs, and all the industries together will be able to share common problems and to reach independent solutions.

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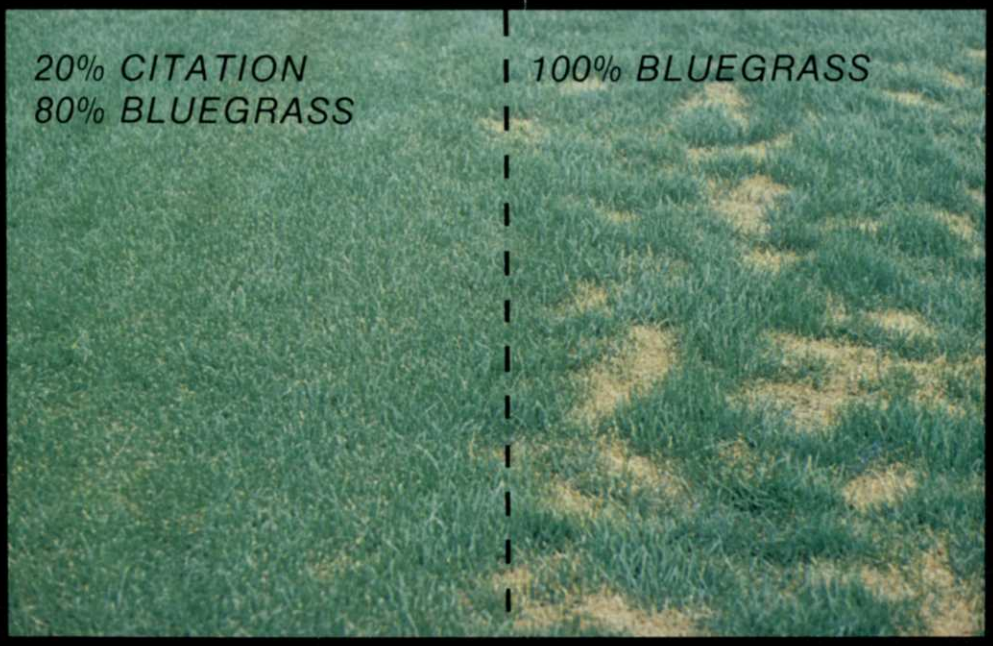

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LETTERS

I am writing in response to a letter written by Mr. Eric Madisen, Jr. Editor, *Park Maintenance*, in the March, 1978 issue of *Weeds, Trees and Turf*. My purpose in writing is certainly not a personal grievance with Mr. Madisen nor with parks people because I count numerous park and recreation directors and maintenance supervisors as close professional friends and associates in the Pacific Northwest. My question is, who are the parks professionals and what is their position in the important issue of turfgrass management. In my view we have two distinct professional groups in parks — the administrators (P and R directors) and the professional grounds supervisors. Frequently in small park districts this individual is one and the same. He has to double as the director and the supervisor.

With regard to the golf course superintendents receiving too large a slice of the cake in research and attention in publications such as *Weeds, Trees and Turf*, I feel it is because they are better organized and show a great deal more enthusiasm, interest and support in these areas than many parks people particularly in the Pacific Northwest. I am sure that parks people know that most of the research conducted is as adaptable and useful to parks as it is on golf courses, but when we hang the name of a golf course on released information it is usually branded as being suitable only for the golf courses. Fairways and tees on golf courses are very similar to the management of most park areas. Work done on putting greens in research and by the golf course people, especially from the standpoint of specialized soils, is easily adapted to high use playgrounds and athletic fields in the parks system.

I have attended many parks meetings including meetings of the NRPA and find that most of the attendance is composed of administrators. The person actually responsible for making decisions in turf and ornamental maintenance is frequently not present at these meetings where technical information about this type of management is being discussed. Furthermore it appears that the maintenance supervisors are not as well organized as the administrators and they have less exposure to turfgrass conferences, field days, workshops, etc.

It also appears, from where I sit, that parks have placed their emphasis on hiring professional administrators which is highly justifiable and neglecting to hire highly skilled and trained people to supervise what happens to the park maintenance system. Highly experienced or college trained agronomists and horticulturists should be considered for key roles in the parks system.

I would have to ask the question also, is there a movement in the parks system for professionally upgrading the maintenance supervisors such as the progress made by golf superintendents over the past 20 to 30 years.

In conclusion, I would encourage the parks to get better organized on the maintenance supervision level and give these key people opportunity to professionally improve themselves and you will find there is lots of help available. I will be very happy to work with parks people as I have for the past 20 years, but a little organization will tremendously improve their professional status.

Roy L. Goss, Agronomist
Washington State University
Puyallup, Washington

When information on advertised products is sought by circling numbers on the reader card, advertisers send information but hardly ever quote prices. They could save a considerable amount of time and money on follow-up if they provided price lists on the first mailing. Surely, affordability must be the primary consideration of the prospective buyer.

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YOU DON'T EAT SOUP WITH A FORK.

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GREEN INDUSTRY NEWS

TURF

Sod producers set for field days in Spokane

The American Sod Producers Association will hold its summer meeting and field days for the first time in Northwest seed country, July 19-21 in Spokane, Washington.

"Between 350 and 400 sod producers and suppliers will be attending," according to ASPA President Glenn Rehbein. The convention will be hosted by seed producers and processors at the Sheraton Spokane. Doyle Jacklin, marketing manager for Jacklin Seed Co., is the convention chairman.

A tour of seed production areas and idea exchanges with seed growers and processors is planned. Field demonstrations will take place at the Schneidmiller Sod Farm in Liberty Lake, Washington, and the George Thayer facilities in northern Idaho.

A salmon bake and a special ladies program are planned.

Persons interested in attending should contact the American Sod Producers Association, 9th & Minnesota, Hastings, Ne. 68901. (402) 463-5691.

View of the Spokane convention area.

Broader experiences with netting in sod planting and increased uses of sludge as a fertilizer were among topics highlighting the Midwinter Conference of the American Sod Producers Association held Feb. 12 to 15 at the Nassau Beach Hotel in the Bahamas.

Over 300 delegates attended the seminars, which this winter focussed not only on sod production but also included discussions of the economics of farming, from tax matters to wage and hour laws and application of insurance programs.

A diversified group of speakers ranged from Dr. Paul Hall, of Virginia Polytechnic Institute and State University, who spoke on uses of sewage sludge in sod production, to L. S. Wilson, of the E.I. DuPont Company, who gave a stimulating talk on the importance of communications in business and home life.

Other speakers were Doyle Jacklin, of the Jacklin Seed Co., Spokane, Wa.; ASPA legal counsel William A. Harding; Paul Smith, CLU, of Fringe Benefits Design in Kansas City, Mo.; John Hope, of Manderley Turf Farms, North Gower, Ontario, Canada; Charles Lain of Pine Island Turf Nursery, Sussex, N.J., and Allen McDowell, of Alexander & Alexander, Lincoln, Neb.

Against a detailed scientific outline by Dr. Hall on the application of sludge in sod growing, Tom Thornton, of Thornton's Turf Nursery, Elgin, Ill., reported fine practical results after a year's use of "digested sludge."

"Once it catches on, it will benefit just about everybody," Thornton said. "We get the sludge free from Chicago's Metropolitan Sanitary Department, and its immediately recognized advantages are the low cost and its existing values in nitrogen, phosphates, potash and trace elements."

The picturesque jagged peaks of the Cascade Range located between Seattle and Spokane.

RECLAMATION

Grants from coal tax to be distributed soon

Landscape contractors may be able to cash in on a federal government program to reclaim abandoned coal mines when an estimated $98 million is distributed starting this summer.

Officials from the Office of Surface Mining, a new agency in the U.S. Department of the Interior, said it would decide by mid-May on project sites.

Almost $34 million was collected from October through December

from a tax on coal mined by operators to support the reclamation program. Surface mining officials hope to collect $140 million during the program's first year.

The abandoned mine reclamation fund is part of the Surface Mining Control and Reclamation Act of 1977. In November, Joan Davenport, assistant secretary for Energy and Minerals in the Interior Department, asked the 50 governors to submit a list of sites in need of reclamation. About 300 proposals were made, and the Office of Surface Mining has narrowed that list to between 20-30 sites as of late April.

Potentially hazardous mines, such as those near school buildings or others that could cause personal injury, will be the first projects chosen for reclamation.

About $70 million will be returned to the states during this first year so they can administer their own programs. The federal government will keep 20 percent of the money and finance its own projects.

Ray Booker, a division chief for the abandoned mine program, said the federal government will be "working as closely as we can with the states." He said contractors should contact departments in their state governments most likely to handle a reclmation project for information on bidding procedures and other details about the program.

Many states will administer the program through their Department of Natural Resources. Others may have agencies for mining or, as in Oklahoma, a Conservation Commission.

NURSERY

AAN offers advice on loss deductions

The American Association of Nurserymen's legal counsel has offered the following thoughts as to the availability of federal income tax casualty loss deductions arising out of the recent extraordinarily cold winter conditions in the North and East and drought conditions in the West.

The IRS takes the position that damage caused by drought cannot be a deductible casualty loss, since it does not occur suddenly. Nevertheless, some courts have allowed such deductions, and taxpayers may wish to seek legal or accounting advice on such cases.

Plant damage caused by freezing conditions can be a deductible casualty loss, where the freeze is unusual. It depends upon normal conditions for the area.

Inventory losses not covered by insurance do not generate a casualty loss deduction because they will automatically result in a greater deduction for cost of goods sold. Where covered by insurance, inventory losses may either be reflected in cost of goods sold based on clsing inventory, with inclusion of the insurance recovery as gross income; or alternatively, the taxpayer may ignore the insurance recovery and remove the loss from the cost of goods sold.

In the case of landscaping on a customer's business premises, the taxpayer may claim a loss based on the "before" and "after" value of the damaged plants, but the loss may not exceed the adjusted basis (depreciated cost). There is no need to consider the effect of the loss on the value of the entire property.

The legal question, where the plants represent landscaping of nonbusiness property, is the amount of loss reflecting the "before" and "after" value of the entire premises. As a practical matter, the IRS recognizes a replacement cost invoice or estimate as reasonable evidence of the loss in value of the property, unless there is reason to believe that restoration of the particular plant is not necessary, or would enhance the value of the property above its precasualty value.

Difficult questions arise in the case of damage to trees or other specimens which are too large to replace with plants of a similar size, since it would not be possible to obtain evidence of replacement cost. The IRS takes the position that shade tree appraisal methods may not be used, and that it is necessary to obtain a "before" and "after" appraisal of the entire property by an expert real estate appraiser.

The AAN in cooperation with the Council of Tree and Landscape Appraisers and other landscape groups, was unsuccessful last year in seeking an amendment to the IRS regulations to overcome this problem. The possibility of a legislative solution is under active consideration.

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GOVERNMENT UPDATE

Labor reform act has pro-union effect

The Chamber of Commerce of the United States says legislation currently before the Senate would make it much easier for a union to organize a non-union work force.

The Chamber's Labor Relations Attorney G. John Tysse told WEEDS TREES & TURF, "The greatest adverse effect will be on the smaller non-union company such as the landscaper. A provision in the Act permits union organizers to come on business property to talk to non-union employees if the owner talks to employees in the same way. An outdoor situation like landscaping makes it even easier."

Under the Act a union could force an election within 21 days of petitioning the National Labor Relations Board. "An employer hasn't enough time to react to union pressure in 21 days," Tysse stresses.

2,4,5-T RPAR involves 424 different products

A rebuttable presumption against registration issued by EPA last week against 2,4,5-T will affect more than 424 products of 122 companies and 21 products with former state registrations pending for federal registration. EPA cited "industry's apparent inability to produce 2,4,5-T without TCDD contamination" and said "TCDD must also be considered when assessing 2,4,5-T by the agency's risk criteria."

Oncogenic effects were a major factor for the RPAR. EPA summarized, "The studies indicated that 2,4,5-T containing less than 0.05 p.p.m. TCDD or TCDD alone have oncogenic effects in two mouse strains and one rat strain. Since 2,4,5-T, as currently formulated, contains TCDD (at a maximum amount of 0.099 p.p.m.), a rebuttable presumption against the registration of 2,4,5-T products has arisen because of the oncogenic effect of 2,4,5-T and its contaminant TCDD.

EPA bases none of its RPAR on bioaccumulation or other environmental effects, giving 2,4,5-T a clean bill in many studies cited in the RPAR. A National Academy of Sciences report was cited which said 2,4,5-T and TCDD have never been detected in drinking water in tests sensitive to parts per trillion. Concerning food EPA summarized, "FDA Market Basket Survey Samples from 1969 through July 1974 showed no 2,4,5-T residues (detection limit: 0.02 p.p.m.) in 155 total diet samples involving 1,869 food composites."

Rebuttals to the presumption against registration are due at the agency by June 5.

Reregistration costs may soar 50 percent

A draft of a report by EPA's Office of Pesticide Programs indicates that guidelines change could increase the cost of reregistration from $691 million to $949 million. The guideline changes involve Section Three of the revised Pesticide Law (FIFRA).

Some of the figures and assessments in the draft include:

—Cost of meeting the guidelines' data requirements for new active ingredient nonfood use, $375,000.

—Consumer costs of the guidelines, 10¢ to 35¢ per capita per year during the 1980's.

—For a major agricultural pesticide, the one-time cost of compliance with the guidelines, including filling data gaps, would be about $1 million.

—Some very small formulators, which, for example formulate only one product, might go out of the pesticide business if they have to meet the data requirements of the guidelines.

TURF

Adjuvants may reduce crabgrass germination

Tests conducted under growth chamber and breenhouse conditions at the Delaware Agricultural Experiment Station has shown that several wetting agents can be effective in reducing germination of hairy crabgrass seeds, according to Dr. William H. Mitchell, University of Delaware turf specialist. Mitchell's tests have shown that both dormant and geractively germinating seed are damaged by wetting agents. However, there was rarely a complete kill in any given test.

Subjecting treated seed to subfreezing temperatures for a period of 12 hours increased the effectiveness of the wetting agent. Since crabgrass plants are easily destroyed by freezing temperatures, Dr. Mitchell speculates that using wetting agents prior to cold weather may have the effect of triggering germination, thus setting the stage for further seed damage.

Dr. Mitchell presented information regarding his research at a recent meeting of the Northeastern Weed Science Society. Part of this research has been supported by a grant from the Delaware Turfgrass Association.

LAWN CARE

Manufacturers form lawn and garden group

An association of lawn and garden manufacturers was formed in April with the goal of establishing a cohesive force that will further the growth of the lawn and garden industries.

The Lawn and Garden Manufacturers Association is headquartered in Chicago according to LAGMA President Edward Scofield, executive vice-president of Rapid-Gro Corp., Danville, Ill.

The group's vice-president, E. Olansky of Science Products Co., Chicago, said there has been great interest in membership and that a number of working committees have already been formed. Interested persons may contact LAGMA, One Illinois Center, 111 East Wacker Drive, Chicago, Ill. 60601.

Continues on page 63

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Pictured left to right: Model 698, Model 608, Model 657, and Model 600. WEED EATER®, Inc., a subsidiary of Emerson Electric Co.

PEOPLE

The members of the National Arborist Association recently elected new officers at the annual meeting in Sarasota, Fla. Seated, from left to right, are: **Larry Holkenborg,** Sandusky, Ohio, 1st vice-president; **Kenneth B. Kirk,** St. Louis, Mo., president; **Bruce Walgren,** Hartford, Conn., 2nd vice-president. Standing, from left to right are: **Gerald Farrens,** Jacksonville, Fla., immediate past-president; **George Tyler,** Amherst, N.H., director; **Lee Lesh,** Saratoga, Calif., director **Earl Sinnamon,** Denver, Colo., director; **Erik Haupt,** Sheffield, Mass., treasurer; **Walter Money,** Rockville, Md., secretary; and **Neil Engledow,** Indianapolis, Ind., director. Tyler, Sinnamon, and Lesh serve as directors with time remaining on their current terms of office.

The first NAA "Awards of Merit" were also presented at the meeting. Recipients included: **Dr. Paul Tilford,** Wooster, Ohio, NAA executive secretary from 1941-1966; **Ross Farrens,** Reno, Nev., charter member and past president of NAA; and **Edwin E. Irish,** Warren, Michigan, past president and chairman of the NAA Education Committee.

NAA Officers

David Canavan took over new duties as president of the Golf Course Builders of America at the annual meeting in San Antonio. Canavan has an extensive background in the world of golf. He is currently president of Moore Golf, one of the country's largest golf course construction contractors operating throughout the nation. He has a degree in agronomy from the University of Massachusetts and is a registered landscape architect. Canavan is a past-president of the Greater Washington Golf Superintendents Association and a past director of the Mid-Atlantic Association. He succeeds Eugene Brown.

Other officers who took over new duties at the meeting include Harold E. Bishop, president elect; Carl Hedlund, secretary; and James J. Krichdorfer, treasurer. Both Hedlund and Kirchdorfer were re-elected.

Steve Gipson has been elected president of the Northern Ohio Golf Course Superintendents. He has been a member of both the Golf Course Superintendents Association of America and the northern Ohio chapter since 1968.

Dr. Henry Indyk

David Canavan

Dr. Homer LeBaron

Dr. Henry W. Indyk, Cook College, Rutgers University, received the "Irrigation Man of the Year Award" at the Irrigation Association's recent conference in Cincinnati. The award is presented to university and government personnel who have made outstanding contributions toward the further acceptance of good irrigation practices. Indyk is the 21st individual to be honored since the inception of the award in 1952.

Indyk serves as Extension Specialist in Turfgrass Management at Rutgers and holds the title of full professor. He is responsible for all extension activities relating to turfgrass establishment and maintenance, as well as providing assistance in the diagnosis and solution of varied turfgrass problems. Proper soil moisture management constitutes an important area of emphasis in his work.

Dr. Homer M. LeBaron, senior scientist in environmental investigations for Ciba-Geigy Corp., has been elected a Fellow of the Weed Science Society of America. He was honored for his assistance and relationship with more than 100 graduate students, plus scientists from universities and government. He was also saluted for coordinating and distributing more than $1 million in grants to university faculty and graduate students for weed control and other studies.

Dr. LeBaron is past president of the Northeastern Weed Science Society and is a member of the American Society of Agronomy and American Chemical Society. He received his B.S. and M.S. degrees from Utah State University and his Ph.D. from Cornell University.

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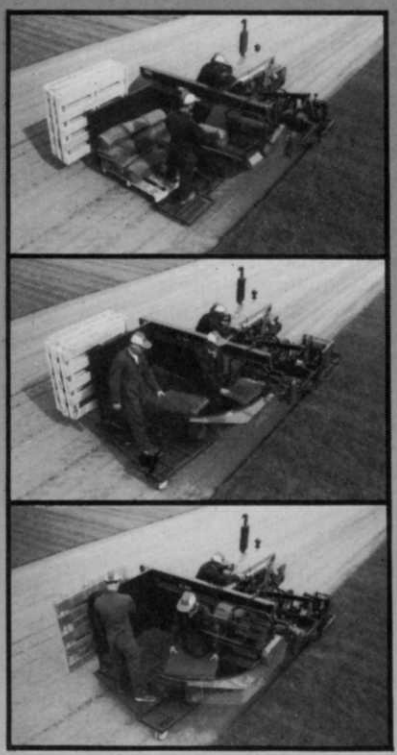

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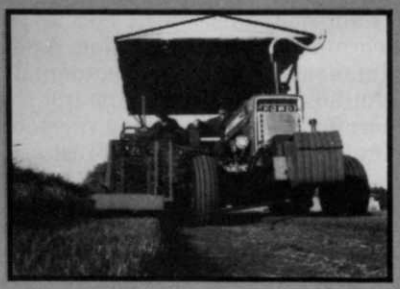

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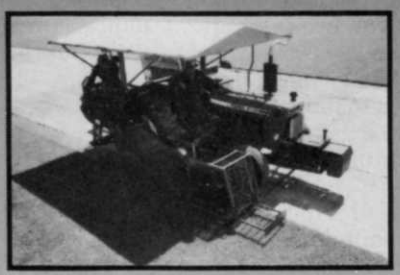

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UPDATE: UTILITY RIGHTS OF WAY LITTLE HAS CHANGED SINCE 1972

Special Report by the editors of WEEDS TREES & TURF

In 1972, WEEDS TREES & TURF published the opinions of three individuals concerning utility rights-of-way clearance and maintenance; an ecologist, a member of the National Audubon Society, and the superintendent of operations for a utility company. Six years later, we find the market even more polarized than in 1972.

Increased public concern about utility prices has added to the confusion and still no single, objective organization has studied the situation and made recommendations for the most practical and safest combination of methods to provide vegetation control for utility rights-of-way.

Utility companies have had to make their own decisions as to practicality. When you are talking $66,000 for a single brush cutter or $90,000 for a bulldozer, it is extremely important to have the best, most scientific data from which to judge. That type of information doesn't seem to exist. Utilities are at the mercy of chemical and equipment sales people.

Manufacturers of mechanical devices and environmental groups voice suspicions that chemicals are overused on utility rights-of-way. Chemical manufacturers question the practicality and cost of complete mechanical control. Both sides stress costs to the utility and that utilities are under the gun to hold costs down.

Environmentalists recognize the benefit to wildlife from the "edge effect" created by the more than 50 million acres of rights-of-way in the United States, but at the same time fear, often blindly, the residual effects of herbicides. A recent RPAR against 2,4,5-T, a chemical tainted by stories of massive kill-off in Viet Nam forests, indicates that these fear groups can be powerful.

Dioxin, a product created in the manufacturing process of 2,4,5-T, is very toxic, but in what quantities? In order to substantiate adverse levels, measurements must be made in parts per trillion. Laboratory methods already used in trying to substantiate these levels are in question because of the minute measurements necessary. The cost to the chemical companies must ultimately be passed on to the consumer, who passes it to the utilities, who passes it to the public.

It is doubtful that rights-of-way can be totally maintained mechanically. Chemicals are necessary in areas where machinery cannot maneuver. Evidence of root sprouting supports the need for spot use of chemicals. However, the public disapproves of total kill chemical application after all they have heard.

With these points in mind, one would think the most acceptable combination of rights-of-way control is mechanical clearance initially, followed by spot chemical applications to stumps, and maintenance on a regular basis, either mechanically, or with selective chemical applications.

Past experience with the Environmental Protection Agency would indicate pressure from environmental groups is not to be ignored. Anticipating a similar response by EPA to rights of way vegetation control, the industry would do well to adjust now and avoid expensive confrontations with EPA.

As in 1972, we publish the opinions of three individuals involved in rights-of-way management from different viewpoints. Each person makes pertinent points for consideration by utility companies. In 1972, Gordon Mundrane, then operations superintendent for New Jersey Power and Light Co. said, "The art of right-of-way maintenance is retrogressing." Since then we have seen little improvement.

The Ecologist

Frank Egler has been an ecologist since 1947. He has written over 80 articles and a book on right-of-way management. "Plight of the Right-of-Way Domain" is a two-volume work with the second volume documenting the first.

"I would consider the situation bad for the slogan that I have long used: The lowest cost for the most years with the highest environmental value," says Dr. Egler. "On those grounds I see very little, if any, improvement."

"The situation has become highly polarized, according to Dr. Egler. "In the first case, I would say that there are very few basic scientists in this field, the field of right-of-way vegetation management. And some of those who are, are employed by industry and some of them are excellent examples of converted 'biostitutes'.

"Then the basic science itself leaves much to be desired. The field of plant ecology and the field of vegetation management go back through 60 years of problems.

"Thirdly, there are pro-herbicide groups that are applying it as a technology. Most of their trouble is because of aerial uses of herbicides. They do not consider, or consider very inadequately, selective spot application.

"Fourthly, there are the anti-all herbicides groups, which are fretting about human health. I admit that there are hazards and accidents, so are there on the highways. Even as Rachael Carson pointed out in "Silent Spring", it's not that these things should be banned, but that they should be used wisely. I might finally say that they are not being used intelligently. In short, we need wise use of them yet for long term vegetation management.

"The story is a sad social problem. The anti-all herbicide people I run into belong to the organizations that should be helping. I'm thinking of two

leading organizations that are taking the human health anti-all herbicides approach that I feel is the equivalent of banning drugs from hospitals. I've worked in a lot of them, I'm for them, but they don't have the scientific basis they should."

The Chemical Manufacturer

Wayne Wright is a Product Technical Specialist with Dow Chemical Company.

"It is generally true that chemical applications, especially in the East and Northeast coast area, are becoming more and more selective. It's well-established that selective treatment is the cheapest and most effective way to go, rather than using herbicides indiscriminately.

"Normally, a broadcast treatment over the entire rights-of-way is needed only once to establish an initial clearing. What everyone is trying to do is to put the rights-of-way on a maintenance type program, where you only go in and spot treat as needed.

"The initial clearing is becoming of more and more interest. After the initial clearing, they'll go in, cut the tree down, and stump treat it. Then what you need is one broadcast spray in two to three years. After that, you've basically established grasses, forbes and low growing desirable brush and shrubs.

Then all you do is selectively treat, either with injection or a basic treatment of some type. And you treat only the undesirable ones that will cause problems. You do that every two, four or five years, just depending on the lot.

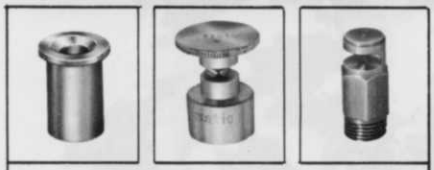
"One of the problems with just mowing the rights of way is root sprouting. Most trees will do this. You end up getting anywhere from two to ten stems coming out of every stem that you cut off. Then, if you go in and try to control those chemicals you have the problem of a massive root system that is feeding all these small individual stems. You just cannot get enough chemical into that root system to kill it. You can burn it off or kill it to ground level, but it will just resprout again.

"A lot of the managers that I know will treat areas and then plant grass to establish a plant community that will crowd out and compete with undesirable brush that grows in.

Bramble and Burns, at Purdue University, did a lot of work with this. It shows, basically, that with broadcast treatment, and then selective treatments a community of low growing grasses, forbes and desirable low growing shrubs become established. The wildlife use of these areas has increased several fold over what it is in any of the surrounding area.

Continues on page 20

A questionable point about total mechanical rights of way clearance and maintenance is that machines cannot stop root sprouting (above).



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The Equipment Manufacturer

William J. Mahoney III is the manager of the Special Products Division of Kershaw Manufacturing Company in Montgomery, Alabama.

"Basically, as the legislatures in various states become more involved in the environment, which is obvious from their record of the last five years, chemical spraying and any type of burning are simply going to be outlawed. That leaves two alternatives: clearing by hand or clearing by mechanical means.

"Clearing by hand is exorbitantly expensive and the chain saw and the bush axe don't fit the hand quite as easily today as they did a decade ago. I am confident that the future is for mechanical brush cutting.

"Right-of-way maintenance programs set up by the public utilities and the electric cooperatives, which are very large in the south, have risen to an outrageous cost where hand labor is extensively used. A tractor with a rotary mower following it can't negotiate much of the terrain and leaves it up to hand crews to get in any damp areas or very hilly terrain.

"Chemical spraying and any type of burning are simply going to be outlawed."

"We're seeing more and more use of large four-wheel-drive brush cutters because they can penetrate areas a tractor cannot. One of these self-contained units can take the place of a multitude of tractors pulling rotary mowers — which obviously means fewer operators and less machinery to maintain.

"We can see the need for spraying in deep swamps and other surfaces that you can't get into with machinery. There are areas that you have to resort to those means which are becoming less and less popular with the public.

Utilities often run into budget problems. And one of the first things to go, according to Mahoney, is the right-of-way maintenance program. "Particularly when it is in relatively good shape," he adds. "From there what happens, obviously, is that the right-of-way gets out of control. And once the trees grow close to the power line, all it takes is an ice storm or high winds to cause a power outage. All of a sudden the budget is quickly rearranged.

"Where before they could utilize farm-type equipment and occasional hand crews, they now have an average of three to four inch diameter growth, or more — too much to cut with a mower. They get into a situation where they have no choice. They simply have to go to a self-contained mechanical brush cutting machine that's designed to cut it. The only other alternative is paying the high price of cutting it by hand.

"We say we cut anything up to eight inches in diameter, which would certainly take care of 95 percent of anybody's right-of-way. Our machine cuts a tree and mulches it in one operation. The result is far better and is more efficient because it leaves a biodegradeable mulch which holds moisture and retards erosion." **WTT**

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Spring	*The following weeds can be controlled with one or more of the herbicides listed on the right:* buckhorn and other plantains chickweed clover curly dock	dandelion English daisy ground ivy knotweed red sorrel	speedwell stitchwort wild garlic wild onion yarrow	Chipco Turf Kleen Chipco Turf Herbicide MCPP Chipco Turf Herbicide "D"
Summer	bahiagrass chickweed crabgrass	dallisgrass nutsedge	sandbur wood sorrel	Chipco Crab Kleen
Fall	*The following weeds can be controlled with one or more of the herbicides listed on the right:* buckhorn and other plantains chickweed clover curly dock dandelion English daisy	ground ivy henbit knotweed lambsquarters mustards pepperweed red sorrel	shepherdspurse stitchwort speedwell wild garlic wild onion yarrow	Turf Kleen Chipco Turf Herbicide "D" Chipco® Buctril® Chipco Turf Herbicide MCPP

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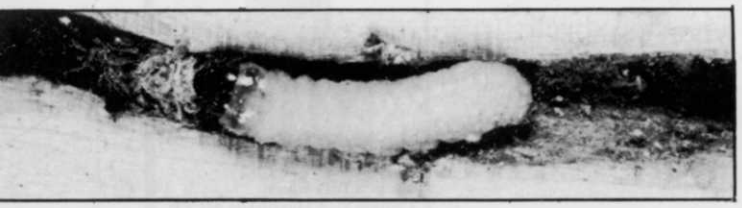
SEX PHEROMONE TRAPS USEFUL IN CONTROLLING TREE BORERS

By David G. Nielson, Ph.D., Project Leader, Woody Ornamentals Laboratory, Department of Entomology, Ohio Agricultural Research and Development Center, Wooster, Ohio.

Borers are the most damaging and difficult to control group of insect pests that attack shade trees and shrubs. Now, after more than five years of experimenting with synthetic sex attractants, a major breakthrough has been made in controlling one important group of borers, the clearwing moths. These moths usually lay eggs on bark surfaces, and larvae hatching from the eggs tunnel into the bark. Consequently, borers are vulnerable to insecticides only from the time they hatch until they chew their way under the bark surface. It is during this short time period that a lethal pesticide residue must be present on bark surfaces to prevent attack and damage.

Before cancellation of DDT and dieldrin registrations, landscape managers applied these materials in the spring before adult emergence began, confident that lethal residues would persist throughout the hatching period of borer larvae. Other insecticides with shorter residual life must now be used. Therefore, we must know when adult borer emergence begins so a short-lived residual spray can be applied just before larvae begin to hatch. Until now there has been no economical way to predict seasonal borer emergence.



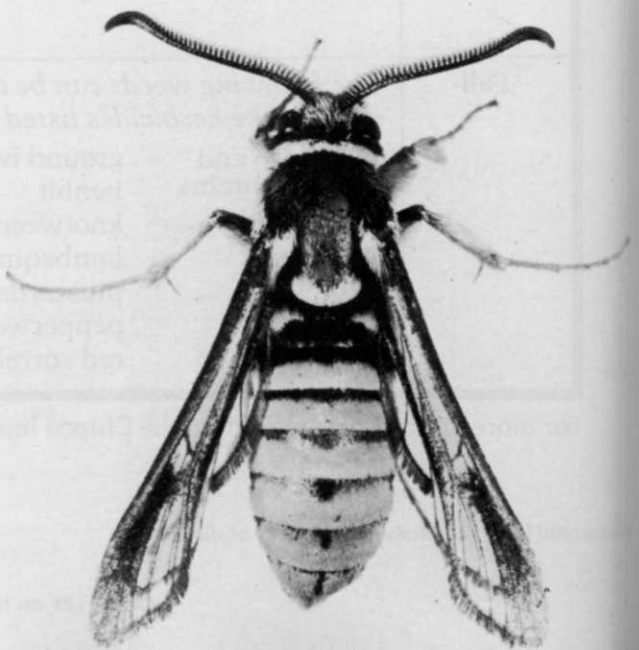
Larvae of a lilac borer inside a branch (above). A classic case of mimicry, yellow jacket (left) and the adult oak borer (right).

Clearwing Moths: Clearwinged moths include some of the most common and destructive borers of trees and shrubs. Although most moth species fly at night, clearwing moths fly during the day. They resemble wasps or bees in both physical appearance and behavior, but they cannot sting. They feed only on nectar, if at all, and probably live no more than a week. Consequently, they do not cause damage themselves.

Soon after female clearwing moths emerge from host trees or adjacent soil, they begin to emit a sex attractant odor into the air. Males detect the odor (called pheromone) with their antennae and fly upwind towards the female until they locate and mate with her.

After mating, the female usually deposits her eggs in cracks and crevices on tree bark. Larvae hatch several days later and bore beneath the bark where they construct galleries. Feeding and tunneling by growing larvae damage the plant by weakening limbs and trunks and destroying tissues that transport food and water throughout the tree.

Attractants for Male Moths: The chemical composition of two clearwing moth sex attractants was discovered in 1973. Since that time, attractants have been developed for several destructive species, including lilac borer (= ash borer), dogwood borer, peachtree borer, lesser peachtree borer, and sequoia pitch moth. These attractants are used inside sticky traps to capture



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Clearwing Moths

male clearwing moths as they search for non-existent females. Research to develop attractants for males of other clearwing moth pests is continuing in several parts of the United States and throughout the world.

Using Pheromone Traps: Clearwing moth males are capable of sensing and responding to pheromones up to distances of at least half a mile. Consequently, a pheromone trap need not be located directly in a suspected infestation, but can be placed at a site more convenient for the pesticide applicator or landscape manager. Nurserymen and orchardists can place a trap in a tree near their home or office where it can be inspected daily with minimum effort. This reduces costs associated with using the traps and maximizes chances of pinpointing first emergence of borer adults. Pest control operators are encouraged to use four or more traps distributed throughout their operating area for a given borer species. Traps should be deployed at least two weeks before emergence is expected to begin.

Male clearwings of all species begin emerging before females. Females mate and typically begin egg laying the day they emerge. Moreover, approximately ten days elapse between egg deposition and larval hatch. Consequently, a spray to control a clearwing moth borer species should be applied 10-14 days after the first male moth is captured in a pheromone trap.

Clearwings that emerge during a relatively short time-period (six weeks or less) can be controlled with a single insecticidal spray.[1] If emergence continues after six weeks following the first application, a second application may be required. Duration of the flight period can be measured by removing captured males from the trap at weekly intervals to determine if a second spray is necessary.

Future of Pheromones: Clearwing moth borer pheromone traps usher in a new era in borer control. Traps will be available for demonstration purposes in 1978 and on a commercial basis in 1979.[2] Trap capture information takes the guesswork out of timing borer sprays and reduces probability of unnecessary applications. This scientific approach to pest control introduces landscape managers to the principles and practice of integrated pest management, using all available control tactics to maximize pest control while minimizing impact on the environment.

In the future, we may be able to use pheromones more directly to control certain insect pests. Perhaps enough pheromone traps can be used in a given area to capture all male moths before they can inseminate females. Unfertilized females will then deposit only infertile eggs which, of course, never hatch. We are evaluating this so-called "Mass-Trapping" approach to borer control in North Dakota shelterbelt ash trees.

[1]Consult your state cooperative extension office or land grant university to obtain information regarding insecticides approved for use against specific borers.
[2]Contact your local pesticide distributor about trap availability.

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WHOLESALE GROWERS EXCEED ONE BILLION DOLLARS IN SALES

The wholesale grower and the sod producer are the farmers of the Green Industry. Their problems closely resemble those of agriculture; business is weather dependent, cash flow and labor needs are seasonal, and equipment and supply costs are much greater than the average small business.

The wholesale grower, the subject of this survey, is constantly searching for ways to beat mother nature. Mechanization, new plant cultivars, and improved growing techniques are utilized to boost productivity and hold down prices in the face of rising costs.

WEEDS TREES & TURF discovered a number of changes taking place within the wholesale nursery industry. Short digging seasons have plagued northern growers for three years. Consequently, more northern growers see containerizing as a solution to poor field conditions. Research into hardier, more disease resistant species and cultivars is being sought and encouraged. Regional surveys are underway to reveal unpopular varieties and discover new ones so growers can concentrate on popular plants. One result of specialization and identification of popular varieties may be increased competition. However, an increasing demand for plant material appears to be counterbalancing the effects of competition. A national marketing program sponsored by the American Association of Nurserymen has the goal of increasing the demand significantly.

To obtain specific data on the wholesale grower, WEEDS TREES & TURF surveyed 936 firms in the United States. A total of 207 returned the questionnaires for a 22 percent return. The Horticultural Research Institute, Inc., has placed the size of the market at approximately 5,000 firms with 70,000 full-time and an additional 70,000 seasonal employees.

More than 70 percent of the wholesale growers are also involved in retailing. Forty-four percent also do exterior landscaping and 17 per-

Concerns of wholesale growers.

Concern	Percentage of Growers Showing Concern		
	Major	Minor	No Concern
Labor Costs	73	23	4
Government Regulations	72	24	4
Supply Costs	66	33	1
Labor Skill	48	40	20
Property Taxes	48	44	7
Labor Supply	41	39	20
Competition	29	50	21
Local Market Conditions	23	48	29

Annual expenditures for various types of supplies.

Item	Average Annual Cost	Cost Projected to 5,000 Firms
Containers	$21,814	$109 million
Fertilizer	$ 8,133	$ 40 million
Soil Amendments	$ 6,869	$34.3 million
Seed	$ 4,073	$20.4 million
Pesticides	$ 2,288	$11.4 million
Herbicides	$ 2,078	$10.4 million
Fungicides	$ 2,055	$10.3 million

Involvement with other types of businesses.

Type	Percentage of Respondents
Retail nursery	70.6
Exterior Landscaping	44
Interior Landscaping	17
Lawn Care	15
Tree Care	15
Sod Production	6
Plant Breeding	1

THE SCHMIDT "CUSTOMIZED CANOPY" TREE

Quality never before offered in a bare root tree.

The "Customized Canopy" developed by J. Frank Schmidt & Son Company employs pruning techniques that produce a tree with a straight leader and evenly spaced branches. The strength and beauty of a mature tree depends upon the symmetry of its canopy. This in turn depends upon the primary limb structure.
Schmidt's "Customized Canopy" provides this structure so subtly that clearance beneath the lowest branch can be increased without destroying the skeletal integrity.
Investigate the Schmidt tree — write for 1978-'79 catalog.

"Pick of the field"
J. Frank Schmidt & Son Co.

J. FRANK SCHMIDT & SON CO.

9500 S.E. 327th Avenue
Boring, Oregon - 97009
(503) 663-4128

cent do interior landscaping. Fifteen percent of the firms do lawn care and tree care. Only one percent indicated they do plant propagation.

Nearly two-thirds of the respondents distribute products in their region only. The average number of acres in production is 122 with a range of one to 1,600 acres. The average number of acres occupied by greenhouses is 1.5 acres.

The growers were asked what percentage of total acreage is used for container stock, shade and fruit trees, and field grown shrubs and evergreens. They were also asked whether or not they plan to increase, decrease or maintain production in the three areas.

The growers reported an average of 17 percent of their acreage is used for container stock and nearly 60 percent plan to increase this area of their business. Six percent plan to decrease container stock production.

The respondents have an average of 35 percent of their acreage for the production of shade and fruit trees. Only 42 percent said they plan to increase shade and fruit tree production. Another 42 percent plan to maintain production and 16 percent expect to decrease tree production.

The largest amount of acreage is used for growing field-grown shrubs and evergreens, 48 percent. Like container stock, nearly 60 percent of the growers expect to increase production. Twelve percent plan a decrease and 31 percent expect to maintain production.

WEEDS TREES & TURF calculated the average gross revenue of a wholesale grower to be $519,853 based upon responses ranging from $1,000 to $15 million. The median of the range was $230,000. Projecting a total industry gross from a universe of 5,000 firms and the median gives $1.15 billion, or projected from the average (mean), $2.5 billion.

Taking the computation one step further by assuming a markup of 300% at the retail level, growers in the United States produce plant material valued at the retail level for $3.45 billion (median) or $7.5 billion (mean). The Horticultural Research Institute, Inc., estimated the value of plant stock at the retail level in 1975 to be $2.7 billion.

When asked about the direction of profits and sales in 1977, three-fourths of the growers indicated sales had increased, but only 43 percent said profits increased. In fact, 30 percent reported a drop in profits while only 13 percent reported a drop in sales.

Growers say labor costs, supply costs, and government regulations are of most concern. Recent minimum wage legislation is making seasonal labor "more expensive." Labor skill and property taxes are concerns of nearly half the respondents. At the present time, growers do not see competition as a major concern.

Growers described seasonal labor force makeup as 66 percent local labor, 23 percent students, and 11 percent migrant farm workers. Forty-one percent indicated labor supply was a problem.

Expenditures for supplies, based upon averages for various materials, total an average of $54,125 per year. This figure does not include expenditures for fixtures or equipment. The greatest single expense is for containers, followed by fertilizer, soil amendments, seed, pesticides and herbicides.

The growers listed the average value of greenhouses as $52,114 and the average value of irrigation systems as $33,095.

Equipment inventories of growers indicated significant purchases of tractors, mistblowers, boom sprayers, compression sprayers, carts and wagons, and rototillers. Based upon averages, growers own a total of 33,000 tractors, 65,000 carts and wagons, 14,400 rototillers, 10,750 compression sprayers, 8,250 boom sprayers, and 6,500 mistblowers.

The American Association of Nurserymen has recently devised a plan to increase the demand for plant materials on a national scale. It is a voluntary program of contributions based on a percentage of the wholesale growers sales. Called the National Marketing Council (NMC), the group will do basic market research into customer preferences and then create and institute a mass media campaign for the entire Green Industry.

WEEDS TREES & TURF supports the idea and sees it as a program worthy of support. We polled the growers in the survey about the NMC. Unfortunately, only 32 percent said they plan to participate in NMC and only 16 percent thought their customers were interested in contributing to NMC. This hopefully will change as word gets out about NMC. Interested persons should contact the American Association of Nurserymen, 230 Southern Building, Washington, D.C. 20005. The NMC will benefit everyone involved in growing, landscaping and maintaining plants. **WTT**

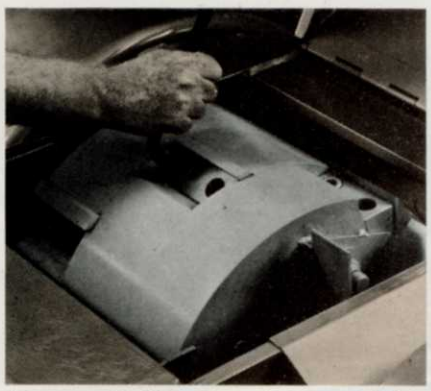
Number of pieces of equipment owned by wholesale growers.

Type	Average Per Firm	Total for 5,000 firms (Projected)
Tractors	6.6	33,000
Wagons	6.1	30,300
Push Carts	4.4	22,000
Motor Carts	2.6	13,000
Rototillers	2.9	14,400
Boom Sprayers	1.7	8,250
Mistblowers	1.3	6,500
Compression Sprayers	2.15	10,750

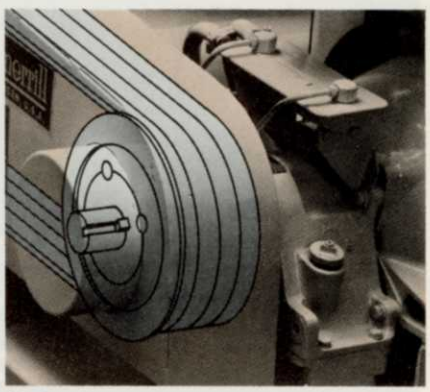
"Sound Conditioned" M & M Brush Chippers for... less noise... more efficiency

Applying engineering designs which "Sound Conditioned"* our industrial scrap reduction machinery, Mitts & Merrill can modify our brush chippers for low noise levels. At the same time, those engineering features which have made Mitts & Merrill the leader for years have been retained.

*Copyright Mitts & Merrill, Inc., 1973, 1974, 1975. All rights reserved.



Staggered knife pattern, for years a Mitts & Merrill feature, has always resulted in a lower noise level. First, by segmenting the noise source. Second, through smoother cutting action. Third, by producing smaller chips.



Optional torque converters and the heaviest steel cylinder — even without an external flywheel — combine to give positive cutting action under the most rugged conditions. Isolates the engine from shock. Minimizes maintenance.

Plus • **Positive safety-lock pin** for greater operator safety • **Swing-away, folding feed chute** protects cutting chamber; allows instant access and increases maneuverability • **Heavy duty construction** includes coil spring, torsion-type suspension, and box tubular steel frame.

mitts & merrill — SUBSIDIARY walco WALCO NATIONAL CORPORATION

Dept. WTT 52, 109 McCoskry St., Saginaw, Michigan 48601

Circle 109 on free information card

CONARD-PYLE COMPANY: GROWING WITH THE ROSE

Container roses are grown in covered quonset house. The plastic is removed at the sides to allow free flow of air.

The Conard-Pyle Company was incorporated in West Grove, Pa., in 1897 as the Conard & Jones Company to sell seeds and plants through a mail-order catalog. Robert Pyle was employed as a helper in 1899, and with his father, purchased a considerable part of Alfred Conard's share of the business upon his death.

Conard's partner, Morris Jones, retired in 1923 and the company name was changed to the Conard-Pyle Company.

Robert Pyle decided that the business would thrive best if it specialized. He thought the specialty should be an item for which there was a fairly steady demand and which was likely to remain popular indefinitely. He fixed upon the rose. In 1908 he trademarked "Star" and Star Roses was born, the chief prod-

An aerial view shows the 22.5 miles of quonset houses at the container production area of The Conard-Pyle Co. A few of the houses are partially covered with plastic.

For ad on following page circle 141 on free information card

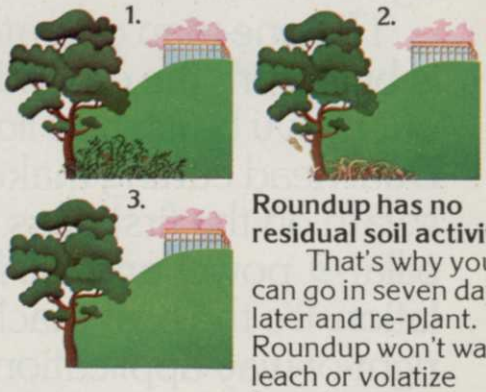
Roundup®. There's no better grooming aid for unruly turf.

Roundup® belongs in your turf renovation program.

Renovation of a weedy fairway, sod farm or other grassy area used to be a laborious and time-consuming chore, but not any more.

Not with Roundup® herbicide by Monsanto. Because one application of Roundup will control many annual and perennial weeds, yet allow you to proceed with tillage and planting operations as soon as seven days later.

Roundup also makes sense wherever treatments for grounds maintenance are called for. One man with Roundup in a backpack sprayer can replace many of the herbicides and frequent repeat treatments that are often necessary.



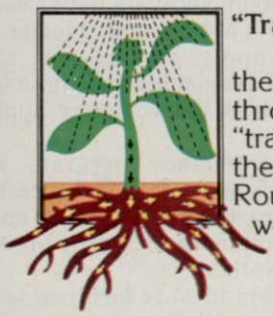
Roundup has no residual soil activity.

That's why you can go in seven days later and re-plant. Roundup won't wash, leach or volatize from the treated area to injure desirable vegetation. Naturally, normal precautions should be observed to avoid spray drift.

Roundup gets to the root of the problem.

Including many of your toughest vegetation problems, like: bluegrass, bermudagrass, quackgrass, bindweed, johnsongrass, fescue and vaseygrass.

Can you afford to let another season go by without Roundup in your turf renovation and grounds maintenance programs? Your local chemical dealer is the one to see for your supply of Roundup herbicide.



"Translocation" is the key.

Roundup is applied to the weed foliage, absorbed through the leaf surface, and "translocated" throughout the entire plant. In this way, Roundup destroys the entire weed, including the roots or rhizomes.

There's never been a herbicide like this before.

Monsanto

ALWAYS READ AND CAREFULLY FOLLOW THE LABEL DIRECTIONS FOR ROUNDUP HERBICIDE.

Roundup® is a registered trademark of Monsanto Company, St. Louis, Mo. © Monsanto Company, 1978.

RI78-04

It runs through the briars, it runs through the brambles and it runs through the timber where a rabbit couldn't go.

If the British had used a Klearway at the Battle of New Orleans, they could have beaten a hasty retreat and returned to face "Old Hickory" another day.

Foot soldiers couldn't make it in the Louisiana swamps, and improperly designed equipment can't make it when you need to clear tough right-of-way.

The one-man operated Klearway is built from the ground up to clean out heavy brush and light timber. Dual head cutting makes a clean swath on the first pass. With Caterpillar® power and full frame articulation, it's the best machine for right-of-way applications.

For complete details, write Kershaw Manufacturing Co., 2205 West Fairview Avenue, Montgomery, Alabama 36108.

KLEARWAY
The army of one.

Circle 113 on free information card

uct of Conard-Pyle.

There was a substantial decrease in the mail-order nursery business due to the great depression in the early 1930's and a garden center for retail sales was opened. It grew and prospered and a branch was established adjacent to the rose fields for the summer months when roses were in bloom. In 1961, another branch was opened at Lancaster, 40 miles west of the nursery.

The Conard-Pyle Company owns 550 acres. Of this, 80 acres are devoted to container-grown ornamentals and about 65 acres to field-grown roses. While there is an acre of greenhouses and 1½ acres of cold frames, there are 22.5 miles of plastic-covered quonset huts.

The company employs 80 to 100 field and greenhouse workers and 23 office personnel. Forty-five of Conard-Pyle's employees have 15 or more years with the company.

About 500,000 rose bushes, 500,000 ornamental container plants, 250,000 container roses, 250,000 miniature roses, 75,000 chrysanthemums and 30,000 delphinium are produced yearly. Ninety-five thousand orders are filled yearly and 440 trailer loads of container grown plants go out each year.

Conard-Pyle distributes 400,000 catalogs and 120 million individual sales messages to sell their products. The company is a member of All-American Rose Selections, Inc., American Association of Nurserymen, American Horticultural Society, American Rose Society, Horticultural Research Institute, National Landscape Association, National Association of Plant Patent Owners, the Society of American Florists plus state organizations.

Containers are moved on wagons pulled by one of 20 International 454 tractors that the company owns. The system is palletized for shipping and pallets are placed on wagons. Five larger tractors are used for cultivating the fields and pulling the spray rigs.

Two boom sprayers with 500-gal. tanks and a 500 gal. mist blower are used to apply part of the 1,800 pounds of fungicides and three tons of herbicides the company applies yearly.

A maintenance program was started this year. Two full-time mechanics are employed to work on all of the equipment including preventative maintenance.

A soluble 15-20-24 fertilizer is applied through the computerized, automatic watering system, every

ARBOTECT® 20-S
The strongest Dutch elm disease protection you can give a tree.

ARBOTECT 20-S fungicide helps make it possible to save many elm trees that otherwise would be lost.

Injected into the trunk of the tree, ARBOTECT builds a barrier against Dutch elm disease inside the tree itself. It helps prevent the disease in healthy elms, and can often save infected trees if they are treated early enough.

Used along with sanitation, insect control, and root graft elimination, ARBOTECT can significantly improve the effectiveness of a Dutch elm disease control program.

ARBOTECT differs from other elm fungicides in several important ways:

- It is registered at rates high enough to be effective.
- It is concentrated, requiring much less water for injection, so trees can be treated much faster.
- Thiabendazole, the unique active ingredient in ARBOTECT, is highly effective against *Ceratocystis ulmi,* the fungus that causes Dutch elm disease.
- Even though it is more effective and convenient, ARBOTECT costs about the same to use as other elm fungicides.

This year, put ARBOTECT to work in your disease control program. It's the strongest protection you can give an elm against Dutch elm disease.

Arbotect
Strong protection for elms.

MERCK

Agricultural Products
Merck & Co., Inc. P.O. Box 2000
Rahway, New Jersey 07065
ARBOTECT (thiabendazole) is a registered trademark of Merck & Co., Inc.

Circle 146 on free information card

S. B. Hutton, Jr., chairman of the board of The Conard-Pyle Co. inspects stored bare root roses.

These container plants are on pallets ready to be loaded into trailers for shipment.

time the containers are watered. One hundred and fifty tons of fertilizer are applied yearly. The rose fields are fertilized according to soil test data which calls for about a ton of 10-10-10 per acre in the spring and are then top dressed in the fall.

Quonset huts are fertilized at a rate of 150 parts per million nitrogen, through the irrigation system. When material is spaced out the second year for further growth, a drip tube irrigation system is used. Water is supplied from four lakes on the Conard-Pyle acreage.

The roses are sprayed weekly with fungicide, mainly for mildew and black spot. The containers are sprayed every two weeks and about 150 pounds of fungicide are used per spraying throughout the spray season.

Aphids are the major insect problem in the fields and a spray program is instituted as necessary. Mites then become a problem after the plants are brought in. "We use a disease and insect program because buyers won't accept the plants unless they are disease and insect free," says Betsy Scarborough, assistant vice-president.

A soil mix of hardwork bark is composted and pasteurized, but not sterilized. It kills the weed seeds present, but does not prevent weed seeds from flying in and becoming established. "It gives us maybe a month grace period of no weeds and from then on through the next two years, we do have to combat the weed problem," says Scarborough. "We use approximately eight thousand cubic yards of this soil mix a year." About three tons of herbicides are used yearly. They are applied three times: Spring, Summer, and Fall.

Chemicals are purchased twice a year. Spring chemicals are purchased in March. "Then we'll come back again in July and pick up the rest of the summer supplies," Scarborough adds. "We purchase large quantities at a time and store them securely."

Eleven major horticultural organizations are cooperating in a nationwide campaign to make 1979 the "Year of the Rose," presenting that flower as a living symbol of love, friendship and peace. Thousands of people from throughout the world stop each year to see the Conard-Pyle rose fields blooming. Driveways are maintained through the fields for visitors and a picnic area is adjacent to the Robert Pyle Memorial Rose Garden. **WTT**

Can Exhalt®800 cut your fungicide cost in half?

Many turfmen say yes. Our lab tests confirm it. Don't you at least owe it to yourself to spend three minutes reading the story?

For years, fungus disease control has been a source of trouble, frustration and expense. The problem is not the fungicide itself, but the application: how to keep it in place despite torrential rains and irrigation. The problem is wash-off.

That's why the development of Exhalt800 is a milestone of progress in the turf world. Here's the story:

Unlike many sticker-extenders that give little help, Exhalt800 encapsulates every fungicide particle with an armor of protection . . . a sticky, flexible "fabric" that clings to turf and foliage, essentially on contact. Yet it flexes and "breathes" to allow normal plant growth.

Because Exhalt800 keeps much of the fungicide in place, even in extreme weather, it can double or triple the control period. Even if it rains an hour after application, you'll still have effective control (see test chart), with less wash-off and less build-up of residue in soil.

Using Exhalt800, you may save 50% or more because you will need fewer sprays, you will use less fungicide with each, and reduce labor costs proportionately. Meanwhile, you can be confident the disease won't flare out of control. The evidence is clear.

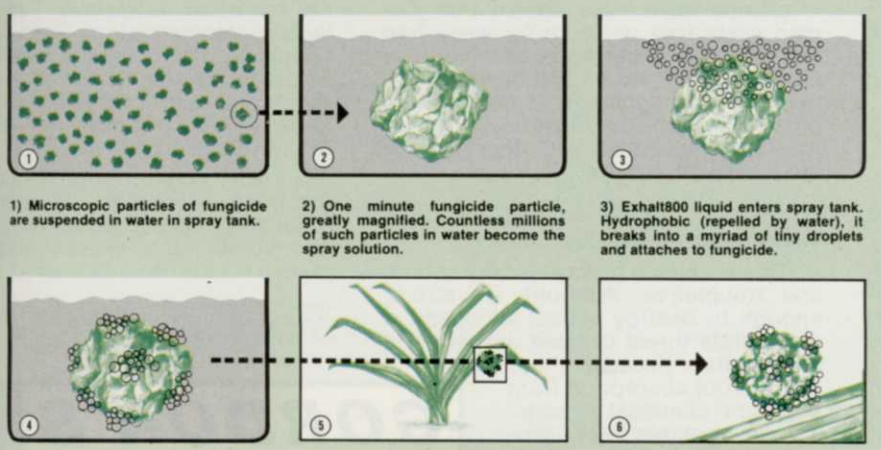
In university field tests using leading fungicides, Exhalt800 added to spray tank at minimum-label recommendations gave control equal to higher recommendations without Exhalt800. With higher Exhalt800 dosages, you can double or triple the control period. Results can vary with the kind of fungicide used.

Exhalt800 costs little because it goes far (mix one pint with each 100 gallons in spray tank). Won't damage turf, trees and ornamentals when used as directed. Easy to use: add to spray tank and agitate. Easy clean-up: rinse equipment with water. If frozen in storage, Exhalt800 won't separate; may be thawed and used.

Too good to be true? The question doesn't surprise us. Compared with its competition, Exhalt800 *is* hard to believe. To know the truth, you should test it. On a golf green. A fairway. On any fungus-infested lawn or foliage.

As an efficient manager, can you ignore the overwhelming evidence? See your Gordon distributor for information, prices and technical assistance.

A closer look at Exhalt®800 — the reason it works



1) Microscopic particles of fungicide are suspended in water in spray tank.

2) One minute fungicide particle, greatly magnified. Countless millions of such particles in water become the spray solution.

3) Exhalt800 liquid enters spray tank. Hydrophobic (repelled by water), it breaks into a myriad of tiny droplets and attaches to fungicide.

4) Tiny Exhalt800 droplets form a porous, flexible "fabric" that encapsulates each fungicide particle (enlarged to show detail).

5) Turf, when sprayed, becomes coated with millions of fungicide particles, each particle encapsulated within the porous "fabric" of Exhalt800 droplets.

6) Encapsulated fungicide particles on blade of grass (magnified portion). The Exhalt "fabric" around each particle is porous and flexible; it lets plant "breathe", flex and grow, releases fungicide slowly.

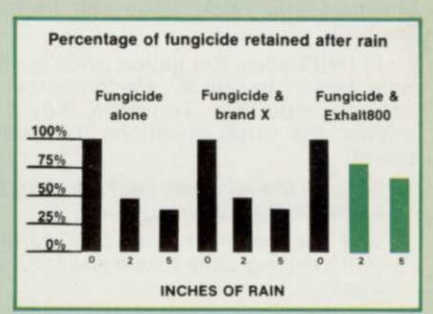


Chart shows how Exhalt800 resisted wash-off in a laboratory test. Spray coatings were applied to glass panels and dried 10 minutes at approximately 70° F. Retention after erosion by rain was measured by solvent stripping the panels and determining the residual fungicide by quantitative ultraviolet spectroscopy.

GORDON'S
PROFESSIONAL TURF PRODUCTS

pbi/gordon corporation
300 SOUTH THIRD STREET
KANSAS CITY, KANSAS 66118
913-342-8780

Let us prove to you that weed control with TRIMEC® costs less per acre

Test Trimec side-by-side with any other broadleaf herbicide for cost-per-acre, the true measure of economy.

In these inflationary times, discovering bargains is a way of life. Housewives stubbornly track down food and clothing specials. Purchasing agents pore over their price lists. And turf managers intensify their search for economy.

In each case, pitfalls abound. Because *unit price alone* can be misleading.

In herbicides, the gallon price is only one factor in value. Performance is equally important. Together, they can answer the three questions that really count:

1. *What is the smallest cost per acre for maintaining weed-free turf?*
2. *Will the smallest cost buy control that's ecologically sound and trouble-free?*
3. *Which herbicide best provides these ideals?*

Certainly you won't find the answers in a price list. You know that honest solutions depend on how much herbicide you use ... and what happens after you use it.

For several years, we've been saying that Trimec is the most effective, most economical, most troublefree broadleaf herbicide you can buy. But you should have more than our word. That's why we want you to test it.

Test it for power

Trimec has broad-spectrum capability. Normally, one light application controls almost all weeds, even hard-to-kill species. In fact, we're surprised when we find a broadleaf weed that's Trimec-resistant. Why? Because Trimec's patented formulation of 2,4-D, MCPP and Dicamba is curiously, synergistically powerful. *The interaction of the three components produces strength much greater than the sum of the separate components.* This synergistic gain multiplies the efficiency, and does it with a small chemical dosage. This synergism also increases Trimec's cool-weather efficiency; it continues to work in late fall, at 50° or cooler.

Test Trimec efficiency

Comparisons have shown that Trimec costs less per acre for weed-free turf than any other herbicide. You use fewer gallons, you seldom need retreatment ... *your total cost is lower.* Such efficiency alone is reason enough to justify a Trimec test. Yet, other benefits are just as persuasive:

Test Trimec gentleness

This herbicide is ecologically sound, and troublefree. Although it's strong enough to destroy almost all weeds, it poses little threat to trees, flowers and ornamentals because there is little root absorption from the light chemical dosage. Tender grasses are protected, too. And the danger of "drift" is reduced. Biodegradeable, precisely factory-formulated, Trimec also eliminates "field chemistry" and the chance of costly mixing errors.

Trimec benefits summarized

- Controls the widest range of broadleaf weeds
- Gets hard-to-kill species with one treatment
- Wide safety margin for lawn grasses, ornamentals
- Minimum hazard from root absorption
- No vapor action after application
- Effective weed control in wide temperature range
- Unique formula overcomes water hardness problems
- Treated areas may be seeded within two weeks
- Non-flammable and non-corrosive in use
- Product stable several years above 32° F.
- Biodegradeable; friendly to the environment
- Bentgrass formula also available

Will you field test it?

We ask you to put Trimec to the test with these suggestions: Search out the worst weed patch in your turf. *On one half,* apply your customary herbicide. *On the other half,* spray Trimec at the label recommendation. Then, watch the effects. Add up labor and material costs. Evaluate the results for each test plot. Whatever your conclusion, we'd like to know. For such information is valuable to our future progress.

Finally, consult your Trimec dealer for prices, technical information and other help. He's listed on the next page and would like to share in your experiment.

Trimec® is a registered trademark of PBI/GORDON Corporation, U.S. patent No. 3,284,186

GORDON'S
PROFESSIONAL TURF PRODUCTS

pbi/GORDON CORPORATION
300 SOUTH THIRD STREET
KANSAS CITY, KANSAS
913-342-8780

Circle 123 on free information card

Prevent grass and weed growth in problem areas with Vegemec™ *Total* Vegetation Killer

Vegemec is the truly effective way to eliminate all weeds and grasses from driveways, fence lines, sidewalks, patios, parking lots, around commercial buildings, fire hydrants, telephone poles, lamp posts, in cracked concrete or blacktop — wherever no vegetation is wanted.

Vegemec kills existing vegetation and prevents new growth during the growing season. Will not leach out to damage desirable grasses, flowers and ornamentals. Self-marking, the effect is promptly visible on treated foliage. A non-volatile concentrate, Vegemec is unsurpassed for efficiency and economy . . . a superior product for total control.

Authorized Distributors Gordon Professional Turf Products

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• Alamasu, Inc.

ALABAMA
Birmingham
• Norala Company, Inc. • Tieco, Inc.
Hartselle • Woolfolk Chemical Works
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Chula Vista • Wilbur-Ellis Company
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Sacramento
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San Gabriel
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• Target Chemical Co.
San Leandro • Custom Chemilene
Santa Ana
• Moyer Chemical Company
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• Agri Turf Supplies, Inc.
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Hazzardville
• Old Fox Chemical, Inc.
So. Windsor
• Turf Products Corporation

DELAWARE
Wilmington • Turf Enterprises

FLORIDA
Homestead
• Atlantic Fertilizer & Chemical
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• Swift Agricultural Chemical Corp.
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Sanford • Chase & Company
Winterhaven
• Swift Agricultural Chemical Corp.

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Peoria • Behm & Hageman, Inc.
Geneseo • C. D. Ford & Sons
Morton Grove
• V-G Supply Company
Rockton
• Turf Management Supply
Springfield
• Drake-Scruggs Equipment, Inc.
Wheeling
• Arthur Clesen, Inc.

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• Desco Chemical, Inc.
• Cory Orchard Supply Co.
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IOWA
Cedar Rapids
• Hawkeye Seed Co., Inc.
Council Bluffs • Leisure-Aid
Davenport • Tri-State Toro Co.
Des Moines
• Toro Service Center
W. Des Moines
• Big Bear Turf
• Resthaven Turf Service
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Sioux City
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Waukee • Baer Ag Supply
West Burlington
• Brayton Chemical, Inc.

KANSAS
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• Pest Control Supplies
• Rhodes Chemical Co.
Salina • The Landsco Corporation
Wichita
• Bartels & Shore Chemical Co.
• Champion Turf Equipment, Inc.
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KENTUCKY
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• George W. Hill & Co., Inc.
Louisville
• Bunton Seed Co., Inc.
• Ky-Inna Turf Supply Co., Inc.

LOUISIANA
Baton Rouge
• Gulfshore Turf Supply
• Wyche's Golf Course Specialties, Inc.
Covington
• Tammany Turf & Supply, Inc.
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SCHMIDT AND SON: PROPAGATORS OF DECIDUOUS TREES

The events and happenings of the past 32 years that formed and shaped J. Frank Schmidt and Son Company of Boring, Oregon are demonstrative of what has and is happening in the bare root shade and flowering tree industry.

The forces and factors were climatic, human and economic. The company grew under the inspiration and directions of J. Frank Schmidt, Jr., the company's president. As in the case of most Northwest nurseries, it began as a family farm-nursery. Each member of the family, three sons and a daughter, branched out into a different aspect of the industry.

Frank, Jr., took the direction of ultra-specialized, mass produced nursery stock. Ultra-specialization means propagating and growing one line of nursery stock, bare root deciduous shade and flowering trees. Such concentration of effort results in the production of a line of trees that represents a careful balance between conservatism with proven trees and forward thinking with tested new selections. Schmidt states, "By the mid-1940's it was apparent that asexual propagation of cultivars was the only way to assure a uniform, predictable product, rather than depending on seed-produced trees that are like people, each somewhat of an individual."

Mass production, strenuous grading standards and continuous trial and error experimentation set the

Three quarters of Schmidt's annual crop is branched two- and three-year-old trees up to two-in. in caliper.

stage for a continuous expansion philosophy. Today the nursery continues to plant approximately 10% more seedlings per year.

"Conditions in the Country were right for this philosophy," comments Schmidt. "Ample production each year beyond experienced sales levels always allowed us to have trees for sale during mid-winter and spring when the specimen tree grower and the retailer discovered the market was going to be stronger than anticipated." As a result, the company's sales graph over the years has been a continuous upswing. "This has permitted us to reinvest in people, equipment, land and facilities," Schmidt states. "It is my belief that a company's purpose for existence is to provide a group of people an enjoyable means of livelihood as they provide for the needs of the customer. The president's main job is to see that the companies policies are maintained in a healthy economic balance."

This spring the company delivered 600,000 trees to customers in 36 northern states and to the Provinces of Canada. The past few years sales increases have averaged around 30 percent. One-third of the crop was sold as one-year whips to specimen treegrowers and two-thirds as branched two and three-year-old trees to retailers and landscapers. Sales Manager, Archie Whiteford, comments, "Each year we seem to sell more trees during the spring months, filling those last minues needs not anticipated by the customer. Having extra trees dug and held in our new 325,000 ft. cooler is going to increase these sales even more in future years."

"Other factors of the industry have contributed to the growth of this Oregon nursery" states Norbert Kinen, business manager. "Previously, most of the Oregon nursery production was sold both through Oregon-based wholesale brokers and re-wholesaler firms scattered throughout the country. Communication and transportation have shortened the distance between the grower and the ultimate customer, reducing costs."

The temperature-controlled tractor-trailer truck has allowed rapid delivery with less handling of the trees. Nursery Trade Shows, ten of which the nursery participates in, have placed the grower and their customers together. "It is one of our major ways to gather feed-back on our trees and address ourselves to special needs," states Frank Schmidt III, vice-president and production manager. "Customized canopy trees were introduced last year as a result of that communication."

Asked about the future, Frank Jr. displays a confidence in a continued expansion of the shade and flowering tree demand. Quality trees and a wider selection of materials will be part of that demand. The growing interest in environmental quality and energy consciousness accounts for the motivation. He expects the national advertising program being developed by the newly created Nursery Marketing Council will stimulate a momentum that will surprise many. "The question is," he says, "are we going to be prepared when it happens."

Trees are dug, graded, and stored beginning in late October through January and shipped beginning late in February, through March and into April. 133 cultivars and varieties are offered in the company catalog of which 33 are patented trees. Slightly over a million seedlings are being planted this spring.

Principal propagating techniques are by budding on a root stock, rooted cuttings. Some are strictly from seed with no asexual propagation and some are grafted. The company produces its own understock in its own seedling department. Seedlings are held in the seedling beds for one to two years, then planted out in fields for one season, at the end of which they are budded. Late the following winter the seedlings are cut off just above the bud of the cultivar and above a good active bud of those that will be grown on their own root. As growth begins in the spring from the selected bud, a device called Grow Straight is placed ¼-inch away to direct the new growth straight upward avoiding a "dog leg" in the tree stem or trunk. After one season of growth from the selected bud, the tree is termed to be a one-year-old tree having a three to four-year-old root. Approximately one-third of each year's produciton is sold as one year whips and the remaining two-thirds is sold as two to four-year-old branched trees ranging in size from five to 15-ft. tall and an inch to two inches in caliper.

All of the nursery's production is sold wholesale to customers in hardiness zones two to six throughout the U.S. If you drew a line from Northern California through South-

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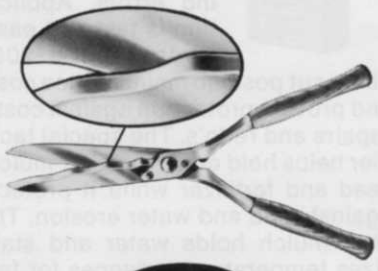

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ern Colorado into Oklahoma, East through Missouri on to Virginia you would establish the Southern boundary of the company's customers. Customers include growers in their local areas for balled and burlapped specimen trees, re-wholesalers and propagating nurseries who resell to retailers, and garden centers and landscape contractors who sell to the commercial and domestic consumer either bare root or by containerizing until the trees are established.

The company holds patents on five trees and the Grow Straight which it produces and sells. Schmidt has established with its employees a joint partnership, a specimen tree nursery called Northwest Shade Trees, Inc. It produces balled and burlapped specimen shade and flowering trees for the West and Northwest U.S.

There are 60 full-time employees, and up to 130 workers are added seasonally. Professional budders are employed, mainly Mexican Nationals who have work permits for this specialized work.

Schmidt spent approximately $100,000 on new equipment last year. It owns 24 tractors of various sizes for work ranging from plowing, discing and subsoiling to cultivating between rows of trees. Four customized diggers are used during the digging operation which are track machine elevated to go over the top of trees, a U-blade for cutting the roots, and hydraulic shakers to remove the soil. All trees are handled on pallets conveyed on trailers and moved by forklifts.

Much of the equipment is customized after purchase for special tasks such as snow blowers for opening up sawdust trenches for winter storage and a compressor rig and boom to convey workers over each row to operate pneumatic shears for stubbing the seedlings down to the selected bud. Other customizing work is necessary to strengthen or adapt machinery such as planters, cultivators and disks for cultivation between the rows. The shop foreman is hired both for maintenance of equipment as well as customizing equipment. There are other types of specialized equipment produced for the nursery industry like tree tag printing machines and tree bundling machines.

Despite the machinery, there is still much hand labor in a nursery of this type which increases the labor cost and the cost of trees. Industry has not evidently found it profitable to address themselves to the needs of this type of nursery operation in designing and manufacturing labor saving equipment. As a result, companies are left to their own resources.

The process, therefore, of merchandising the shade tree industry has been slow. Costs could be cut considerably if there was a means of conveying trees from behind the digger onto pallets without damaging them. Conveying systems for grading trees and handling then in the warehouse in preparation for storage and shipment would also reduce costs a great deal.

The nursery has two acres of humidified warehouses for short term storage and processing of trees, six acres of outdoor sawdust bins for

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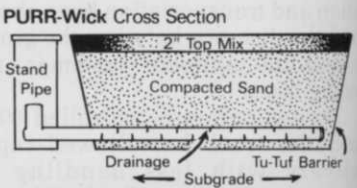

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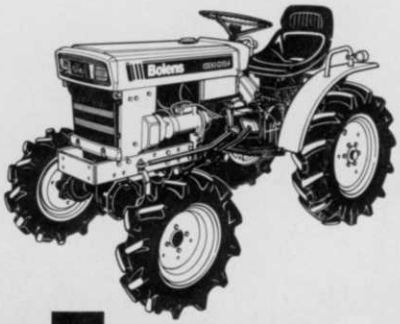

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Schmidt and Sons

tree storage, and 475,000 cubic feet of cold storage for seedling and tree storage.

Nearly all irrigation is done by sprinklers, the Rainbird type. The nursery has eleven wells and three ponds. Normally in the area, trees will consume 3/10 of an inch of moisture per day. The nursery has a system of moisture plugs which electronically monitor the moisture content of the soil at various depths. The moisture plugs indicate when to irrigate and how much water to sprinkle on the field to keep the moisture content above 50 percent of field capacity.

Generally, four herbicides are used for special purposes. Simizone, enide and paraquat are used to maintain control of weeds down the rows. Roundup is used to clean a field before replanting. A wide variety of insecticides is used depending upon the type of insect that is being combatted.

Western Oregon soil is acid. Before planting, approximately every five years, up to three tons of lime must be worked into the soil one year before, to give it time to react.

In our climate, trees do not do well unless they have at least 100 pounds of each of the three major elements per acre. There is no standard fertilization practice in the sense that all fertilizing is done based upon either soil or tissue analysis. Fertilization is done just before planting a field followed by both ground and air applications according to season, the variety of the trees, and soil and tissue analysis. Aerial spraying is necessary in late winter when the fields are too wet for standard ground equipment.

Between crops, soil is built by one year of green cropping to develop humus in the soil and one year of summer fallow to clean the field of any weeds. Weeds are a concern not for the competition that they might give to the trees, but the fact that they become hosts to various types of insects.

Advertising is done in two major horticultural publications in the United States and one major publication in Canada. A second source of advertising is attendance and display at the major trade shows and conventions throughout the sales area. The company attends ten such shows each year. Schmidt has many visitors and at those times when there are special meetings in this area an effort is made to bring visitors to the nursery. For instance, during the A.A.N. Convention in Seattle last year, visitors were brought from Seattle to Portland and given a tour of the nursery's fields and facilities.

The company also publishes a monthly newsletter to inform the customer about various factors of weather, cultural practices, and the outcome for the upcoming crop. Further, it serves to acquaint the

A specialized blower used to weed between the trees and to remove soil build-up around the stems of the seedlings in preparation for the budders.

prospective customer with the company. Beginning in September, a stock available list is published once each month, until January when two stock available lists are published each month until late spring.

Until recently visiting customers was done by staff members from the home office periodically through the summer. Now regional sales representatives are being contracted who will visit each customer periodically.

There has been a gradual evolution from complete use of rail car to tractor-trailer truck. This has permitted more rapid transportation, the customer to get last minute needs, to-the-door delivery, and less of handling the trees. All shipping is done by temperature-controlled trucks contracted with independent carriers through a shipping brokerage firm.

There are several problems, or challenges, to be overcome to keep a healthy shade and flowering tree industry. Labor costs, both direct and indirect, plus inflation are causing sharp rises in the cost of production which must be passed on to the wholesale customer and eventually to the consumer. The minimum wage law is not only effecting the lower portion of the wage scale, but all the way up the line. Indirect costs such as workman's compensation insurance and now the Oregon agriculture unemployment tax have increased our labor costs between 15 and 20%. Furthermore, the agriculture labor supply appears to be dropping as we are expanding.

Absenteeism and turnover are resulting in the need for more supervisory personnel and training time. This fact, coupled with the lack of equipment engineered for the nursery industry, makes us very dependent on a large labor supply. Therefore, a second problem, or challenge, is the development of equipment, either by the manufacturers or by the nurseries themselves.

The third challenge is the need for continuous study to select new cultivars for asexual propagation. There are presently several standard plant materials with undesirable qualities such as disease tendencies and undesirable growth characteristics. Continuous study should go on to provide a wider selection of deciduous plant materials.

The consumer is awakening to his broad range of plant needs. Much time and effort must be expended to provide the consumer with reliable information about the many tivars that are presently being produced. There is need for a broad range study throughout the United States to observe the cultivars which have now been planted under various climatic conditions. To date, standard manuals have not been published containing this information. Studies by Dr. Phillip Kozel at Ohio State University, are recording the desirability of many cultivars now on the market for street and home planting. Similar studies need to be made in many areas. Another important study is the one being carried out by Dr. Lester Nichols at Pennsylvania State University. This one has a broad spectrum of observation of Crabapple trees and their resistance or susceptibility to the five major diseases that effect this group of trees. Observation is going on in many locations. Yearly results on over 600 varieties and cultivars are being summarized by use of a computer. This type of study will establish credibility for the B & B grower to buy and to produce a wider selection of materials. Likewise better credibility will be established for the garden center to stock, sell, and educate the consumer. The same would apply for the landscape contractor and the landscape architect. The next challenge is the need for a forum between the landscape architect and contractors and the growers of tree materials. Future tree needs need to be discussed since it is nearly five years from the time a root stock is developed before a finished bare root tree is ready for sale, or eight years or more before that tree becomes available as a specimen B&B tree for landscape purposes. There is a need for consumer research as basic information for all the various elements of the nursery.

There is a definite trend in demand for higher quality shade and flowering plant materials. The demand and the willingness to pay a higher price for well-grown nursery stock is strongly evident. The consumer is also looking for a wider range of tree characteristics; blossom and color, growth habit, size and general form.

The consumer is probably more open to education now that he has ever been. Efforts are being made for consumer education. It is quite evident that the garden center operators and the landscapers are all beefing up this process in their individual businesses. **WTT**

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Wight is a wholesale nursery, specializing in evergreens. About 60 percent is broadleaf evergreens while the remaining 40 percent is coniferous.

The nursery requires approximately 225 full time employees. Because they are far enough south, seasonal turnover is quite small, not over 10 percent.

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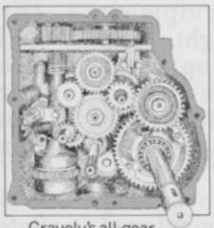

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are used for pulling wagons. Four hundred wagons are used for moving the container stock around. Each wagon holds 361 cans and the wagons are usually pulled in tandem, two to a tractor. Equipment replacement includes about five pick-ups and 10 to 15 tractors a year.

Most of the irrigation system is permanent set, except for some in the field, according to Wight. "It is in beds 100 ft. wide and there's a row every 100 ft. We've probably got 50 miles of rows," he estimates. Water comes from eight lakes on the property and three deep wells that give 700 gallons per minute. All of the containers are irrigated with an inch of water every other day.

Acres of plants are grown under plastic.

Equipment maintenance at the nursery is limited. The heavier jobs are sent to shops. "Equipment quality is good," says Wight, "The price has just gone up, up, up. We're buying all American-made tractors now and they are about 150 percent up from what we were buying them for six or eight years ago."

Most of the chemicals necessary are purchased near the beginning of the year. "In some instance we get bids on large quantities and base it on a year's supply," Wight says. "Lesser quantities we just buy when needed."

Containers are probably the major expense at Wight Nurseries. "We're using primarily one supplier," according to Wight, "and are spending a great deal with them, probably over half a million dollars."

Ninety-five percent of the plants are shipped by refrigerated semi. They are mainly shipped east of the Mississippi River, with occasional shipments into Arkansas and Texas. March and April are the nurseries' biggest months for shipping. We probably ship 40 percent then, says Wight. November through February, we have very little going into the North, but we also ship into Tampa and Jacksonville, Florida, New Orleans and other areas where there's no frost." About forty percent of the northern shipments go in August and September.

"We don't own our own trucks," Wight says, "and we have to compete with Florida produce. If they have a perishable item, they'll outbid you for trucks and then you get into a hell of a problem."

Advertising is done on the back page of "Nursery Business" and a couple of other trade papers with full page ads on occasion.

As far as trends in the nursery business, Wright predicts: "The big ones are going to get bigger. It's getting much more competitive and will continue to do so." **WTT**

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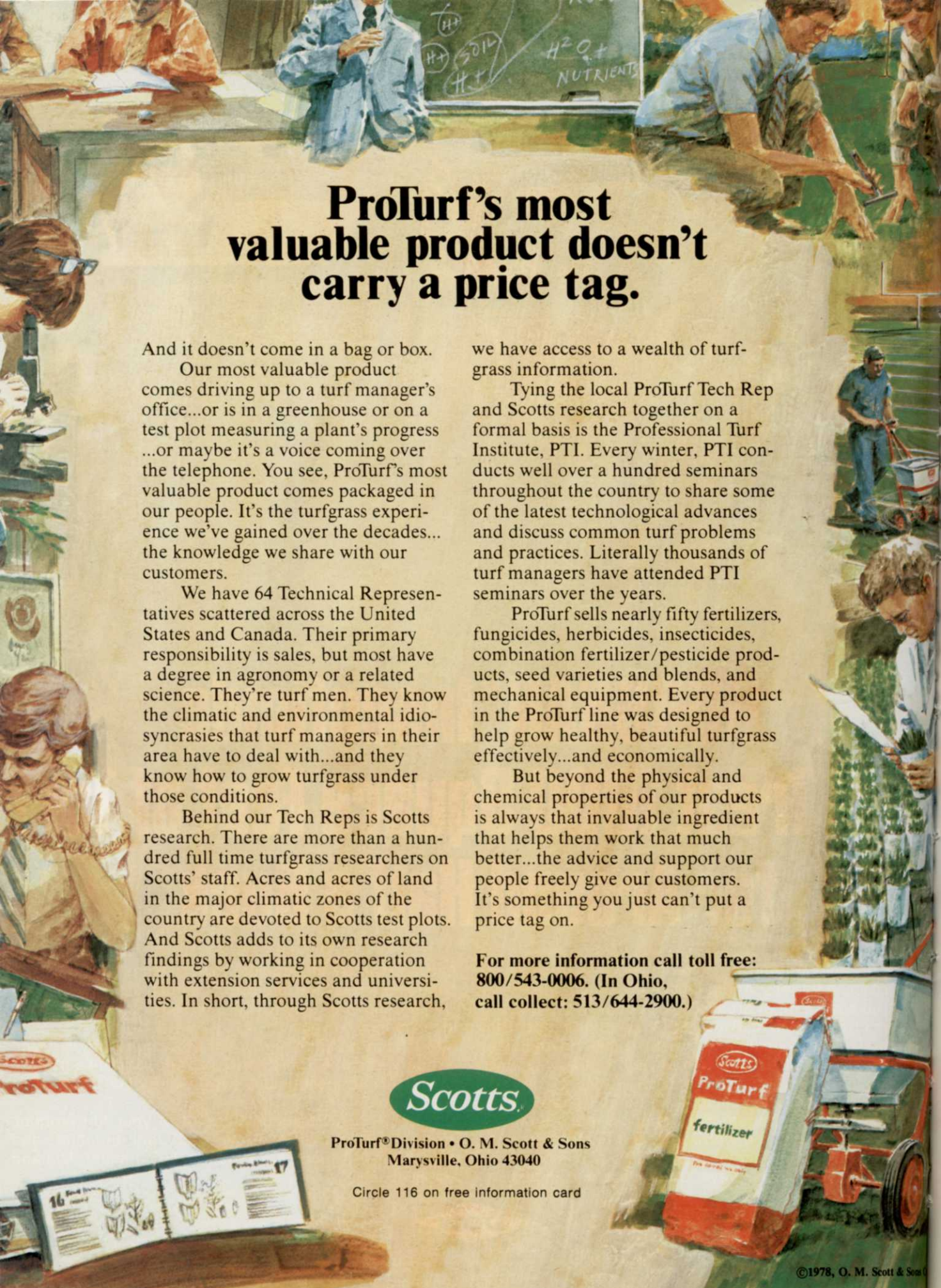

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OPERATION AND CONTROL OF SPRINKLER SYSTEMS

By **James A. Watkins,** Director of Training, Telsco Industries

Part Two: Sprinkler Equipment

Control, or operation, of system zone valves may be manual or automatic.

MANUAL CONTROL

Manually controlled turf sprinkler systems use standard commercial globe valves. Globe valves of either the straight or angle type are acceptable. Angle valves are most commonly used because there is much less pressure loss through this type.

Never use gate valves for zone operating valves. They are not intended for continual use and will soon leak if subjected to such use.

Globe valves with swivel disc holders and soft rubber discs for cold water service should be specified in order to avoid an abnormal amount of maintenance. Brass-to-brass seats inevitably leak under continuous use. Stems should be heavy enough to support key operation without breaking. Stem packing should be generous. Ports through the valves should be full-size to minimize pressure loss.

Manual control valves may be decentralized for economy or manifolded at a central point for control convenience. The latter is more costly, especially on large installations. However, it is accepted practice on residential lawn systems. In any case, manually operated zone control valves should be located so the operator will not get wet, even with wind.

When the valves are manifolded, one group, controlling front yard zones, is usually installed near the front entrance. A second group for the back yard zones is manifolded next to a patio or rear entrance. The two manifolds are then connected by a single supply line from the meter or other source of water supply. See Figure 11.

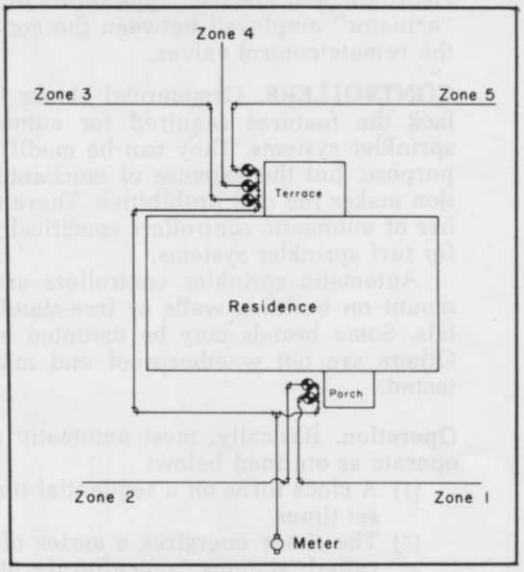

Figure 11: System using standard commercial globe valves.

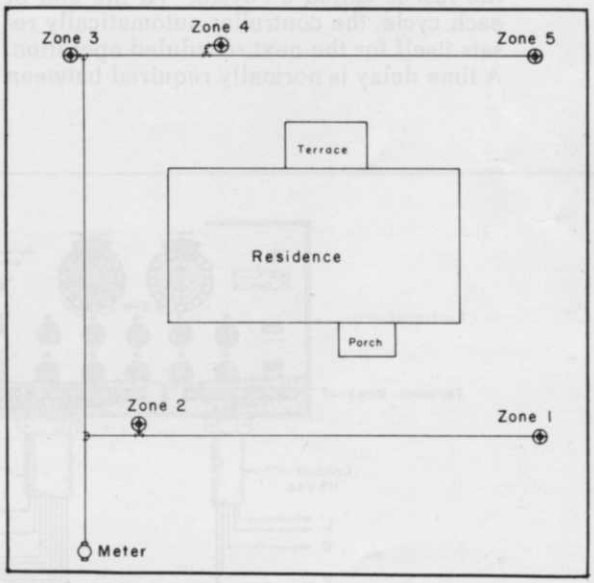

Figure 12: System using remote control valves.

AUTOMATIC OPERATION

Automatic turf sprinkler systems have a great advantage over manual control. They offer complete independence from watering chores, release time for leisure, provide continuity of the watering schedule during periods of owner absence, save water, and save the cost of labor on larger properties. Automatic systems now comprise a majority of the new installation market. The cost over manual control amounts to only a few dollars annually when the added cost is amortized over a twenty year life. These small sums can be recovered in water savings alone!

Automatic control consists of a conveniently located "controller" which operates "remote control valves." One valve is required for each watering zone.

The remote control valves are dispersed throughout the system, thereby saving considerable quantities of piping. See Figure 12. The valves are usually installed at the side entrance to a zone or at the center of a zone, depending on how the main supply pipe is routed. Thus, they are also

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The following article is an excerpt from the Sprinkler Equipment chapter of the TURF IRRIGATION MANUAL by James A. Watkins and is reprinted with permission of the author and the publisher, Telsco Industries. Other chapters of the TURF IRRIGATION MANUAL include Piping, Hydraulics, Water Hammer, Cross-Connection Control, Pumps, Clean Water, Sprinkler Performance, Plot Plans, Head Layout, Pipe Sizing and Zoning, Rotary System Design, Golf Course System Design and Electrical. In addition, the book has 60 pages of design reference tables.

The author, James A. Watkins, is presently director of training for the Weather-matic Division of Telsco Industries and has more than 40 years involvement with turf irrigation. Copies of the TURF IRRIGATION MANUAL are available for $19.50 each plus $1.25 shipping and handling (U.S.) from Telsco Industries, P.O. Box 18205, Dallas, TX 75218.

more efficient and conserve pressure lost in the longer pipe runs of globe valve systems.

There are two types of automatic system: *Hydraulic* and *Electric*. Type refers to the kind of "actuator" employed between the controller and the remote control valves.

CONTROLLERS. Commercial clocks and timers lack the features required for automating turf sprinkler systems. They can be modified for this purpose, but the expense of mechanical renovation makes the cost prohibitive. There are a number of automatic controllers specifically designed for turf sprinkler systems.

Automatic sprinkler controllers are made to mount on building walls or free-standing pedestals. Some brands may be mounted either way. Others are not weatherproof and must be protected.

Operation. Basically, most automatic controllers operate as outlined below:

(1) A clock turns on a sequential timer at preset times.

(2) The timer energizes a series of terminals called "stations," one after the other and in sequence. The entire automatic progression of energizing stations from the first to the last is called a "cycle." At the end of each cycle, the controller automatically resets itself for the next scheduled operation. A time delay is normally required between the ending of one cycle and the clock start of another.

(3) Each zone valve is connected to one of the stations in a pre-selected watering sequence. When a station is energized, the remote control valve is actuated and sprinkling occurs in that zone for a pre-set period of time.

Standard Controller Features. Good automatics will have these features:

(1) An easily adjusted clock monitor for starting the watering cycle at any hour of the day or night.

(2) A calendar dial for programming automatic water cycles on any day or days on a repeating 14-day period.

(3) Sequence timer with variable time that can be easily adjusted for a minimum time limit of not more than 5 minutes. Maximum water time should be not less than 30 minutes for spray systems and 60 minutes for rotary systems. Timing should be independently variable for each station.

(4) Semi-automatic performance, so that the automatic progression cycle can be started manually without disturbing the clock setting. Control should automatically shut off at the end of the manually initiated cycle and re-set for the next scheduled operation.

(5) Manual operation of each station, at ran-

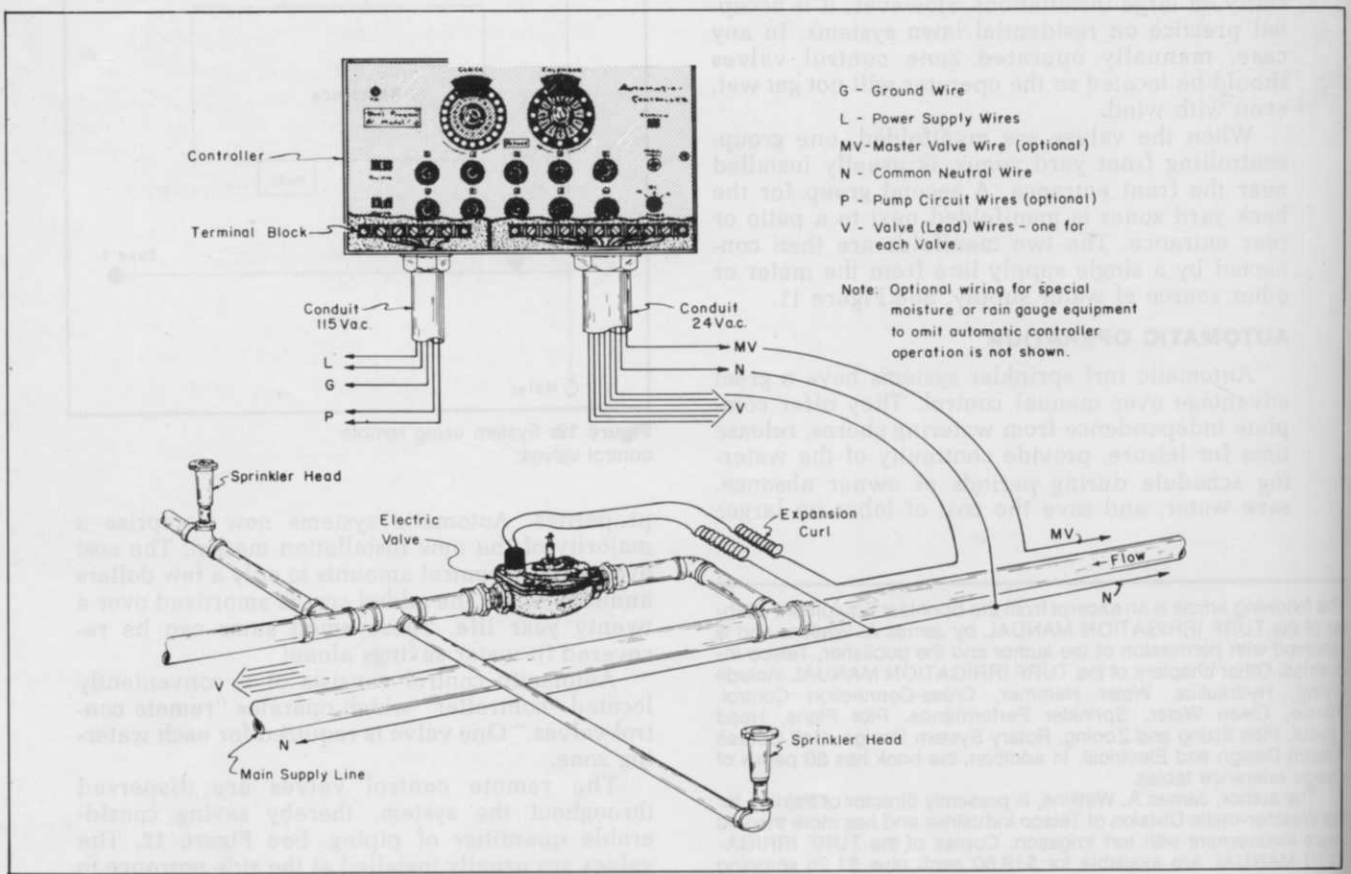

Figure 13: Typical wiring connections for electric controllers.

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dom or in sequence independent of the automatic timer, with switches or other types of selectors.

(6) A master switch, sometimes called a "rain switch," which can be set to prevent the automatic watering cycle from starting during periods when watering is not required or wanted. Use of the master switch should not affect the pre-set program.

(7) Station omit whereby, at discretion of operator, any station or stations can be omitted from the automatic or semi-automatic watering cycle.

(8) Designed so that all programming and operational settings can be easily made on the face of the controller with switches, knobs, etc.

(9) A safety device, such as a solenoid, for hydraulic systems using normally-open remote control valves to shut the system off in the event of electrical power failure.

(10) Instructions for field servicing.

(11) Availability of repair parts.

Optional Controller Features. Many brands of automatic controllers also provide optional features. (Note: some brands may provide some of these features as standard.)

(1) A master valve circuit to provide for operation of a "master" remote control valve at the entrance to the entire system. The master valve automatically opens when any controller station is energized. It is intended to be used in conjunction with certain types of backflow prevention devices.

(2) A pump control circuit to energize a pump whenever a station is energized. Some brands of controllers also provide a means of operating the pump for purposes other than sprinkling.

(3) Dual programming which allows any preselected station to be omitted from the automatic or semi-automatic cycle on any day or days of the calendar program. This feature is generally used to allow less frequent watering of shrubbery areas. With some controllers, stations watered on the secondary program must be selected at time of installation. For all-electric systems, a separate, special wire is required for all remote control valves on the secondary program. Valves cannot be added to or eliminated from this program after installation. However, some brands of controllers do not require the extra wire. And, valves can be added to or eliminated from the program at any time. Re-programming is accomplished by a simple rewiring procedure at the terminal block in the controller. This versatility is preferred in most cases.

(4) In addition, specialized controllers are available for very large area watering such as golf course, park, etc.

Note: On larger systems, more than one controller is often used. Some reasons for using multiple controllers are:

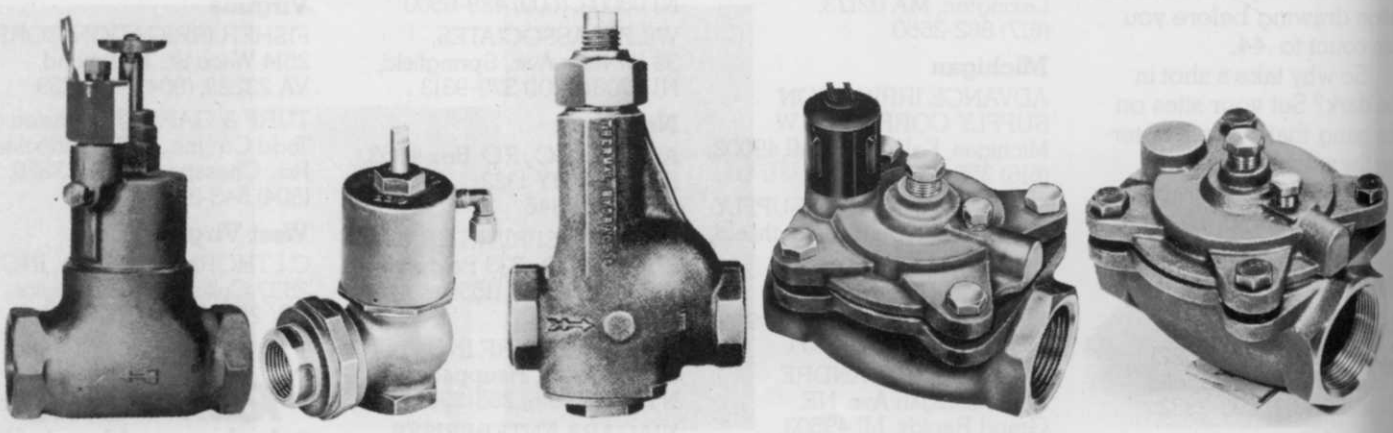
(1) Number of zones exceeds the capacity of a single controll.

(2) Different equipment is used in some areas being sprinkled and separate control is desired for each.

(3) Separate programs of watering are desired or required for certain areas of property. For example, greens and fairways of golf courses.

REMOTE CONTROL VALVES. Valves specifically manufactured for automatic turf irrigation systems are completely buried, therefore less conspicuous. However, there had been a definite trend in recent years to enclose the valves in specially-made boxes, particularly those of larger systems. Such installation makes it easier to locate and service the valves when required.

The most important reason for installing remote control valves in burial boxes is to simplify servicing and operation inspection of the sprinkler heads. Most valves have a "bleed-plug" or other device incorporated in the top to permit



An assortment of valve types used in turf sprinkler systems.

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manual opening and closing. This feature eliminates wasted service time for trips back and forth to the controller location.

Most remote control valves are constructed entirely of brass and bronze. Some have a body casting and bonnet of cast iron which is subject to considerable rusting. However, brass functional parts tend to reduce the overall effect. Recently, some manufacturers have begun to produce plastic remote control valves.

Remote control valves are made on the globe valve pattern almost entirely; the straight type being the most prevalent.

Diaphragm-Type Valves. The most commonly used remote control valves for both electric and hydraulic control are the diaphragm type. For the controller to operate these valves, a water pressure differential must be maintained between the top-side and under-side of the diaphragm. For trouble-free operation, a quality diaphragm is required which won't allow uncontrolled leakage from one side to the other. Quality diaphragms made of such materials as Buna-N reinforced with nylon webbing are practically indestructable.

There is practically no wear in diaphragm valves. Therefore, parts seldom require renewal. There is no swivel motion on seats to cause leakage as in the case of most types of globe valves. Because of this factor, the seat disc can be molded as a part of the diaphragm to further simplify the valve and reduce the number of parts. See Figure 14 and Figure 16. In addition, diaphragm valves do not have stem packing, a frequent source of valve leakage.

Piston Valves. As the name implies, these valves utilize a vertically moving "piston" to open and close the valve. Like diaphragm valves, a pressure differential must be maintained between the top and bottom of the piston for proper operation. Leather or composition cup washers or "O" rings around the piston prevent leakage past the piston (similar to operation of piston rings in an automobile engine).

Leather cup-washers have a tendency to dry out between seasons and shrink away from the "cylinder" walls. When this condition occurs, pressure by-passes the cup-washers causing the valve to become inoperative. "O" rings tend to roll and twist when the valve opens and closes. Excessive wear and deformation caused by this malfunction requires frequent replacement of the "O" rings. Valves using leather cup-washers or "O" rings are also subject to "sticking" after long periods of non-use.

Electric Thermal Motor Valves. This type valve does not use water pressure to open or close. Rather, a thermal (heat) motor directly operates the valve.

Flow Adjustment. Most sprinkler system remote control valves include a flow adjustment device. With some valves, this is an optional feature; others provide it standard. This feature is used to reduce flow and pressure to small zones in order to balance them hydraulically with larger zones. Most flow adjustment devices can be used for complete manual shut-off of the valve.

ELECTRIC AUTOMATIC SYSTEMS. Turf sprinkler systems using electricity transmitted from the controller by wires to operate the valves are classified as "Electric Automatics."

Typical controller operational panel.

Wiring. Electrically operated valves manufactured specifically for turf sprinkler systems require less than 30 volts to operate; usually 24 volts. Direct underground burial of UF or TW wires (UF is preferred) without conduit is safe with less than 30 volts. However, always check local electric codes before designing systems.

Figure 13 illustrates the electric wiring between the controller and electric remote control valves. One "hot" wire is required to each valve from the "station" terminal that controls it. A "common" wire to all valves is the second "leg" of the electrical circuit. Wire sizes depend on the length of wire to the valve and the current requirements of the valve.

The electric current "draw" of different brands of valves and the current requirement of different controllers vary. Therefore, wire sizes must be carefully calculated. Most manufacturers furnish tables or other recommendations to simplify controller to valve wire sizing.

Extreme caution should be exercised when "mixing"different brands of controllers and valves. Be sure the controller can supply enough power for the valve and use care in sizing wiring. Brand "mixing" of controllers and valves is normally not recommended.

Some systems (usually large ones) are designed with one station of the controller operating more than one remote control valve. Before designing such a system, check the capabilities of the equipment that will be specified.

Many controllers for electric automatic systems have this capacity, but the number of valves which can be operated varies from model to model. Multiple valves on a single station require larger wire than for a single valve. And, wire sizing is more critical. Again, follow the manufacturer's recommendations.

Operation: Electric Solenoid Diaphragm Valves.

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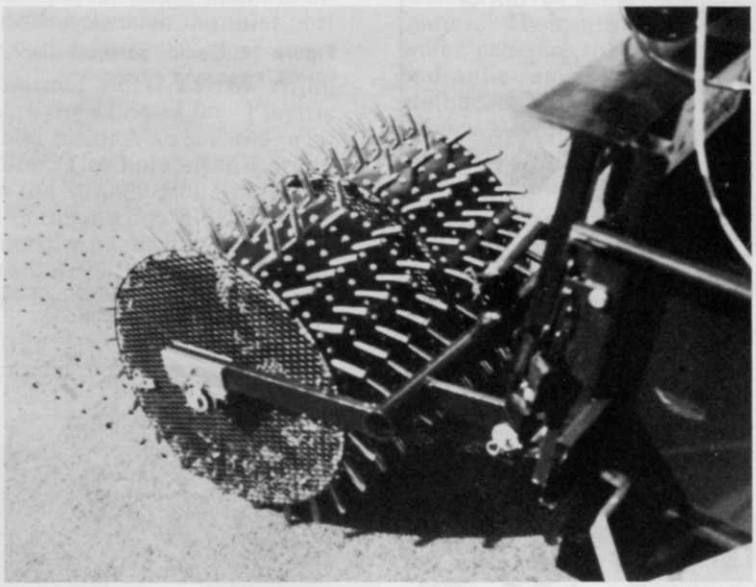

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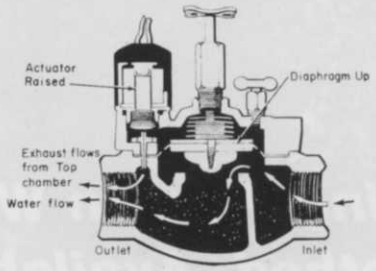
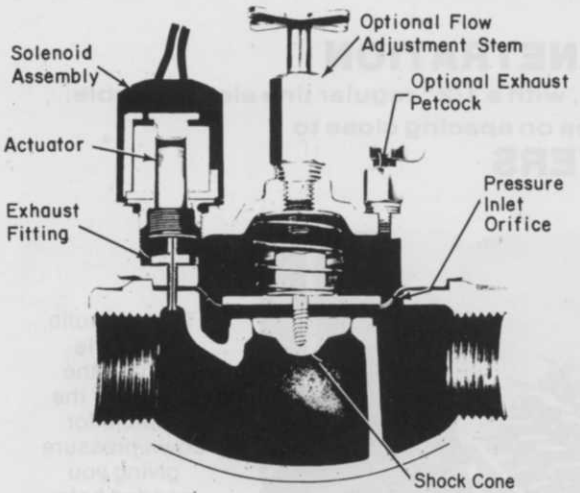


OPEN POSITION



CLOSED POSITION

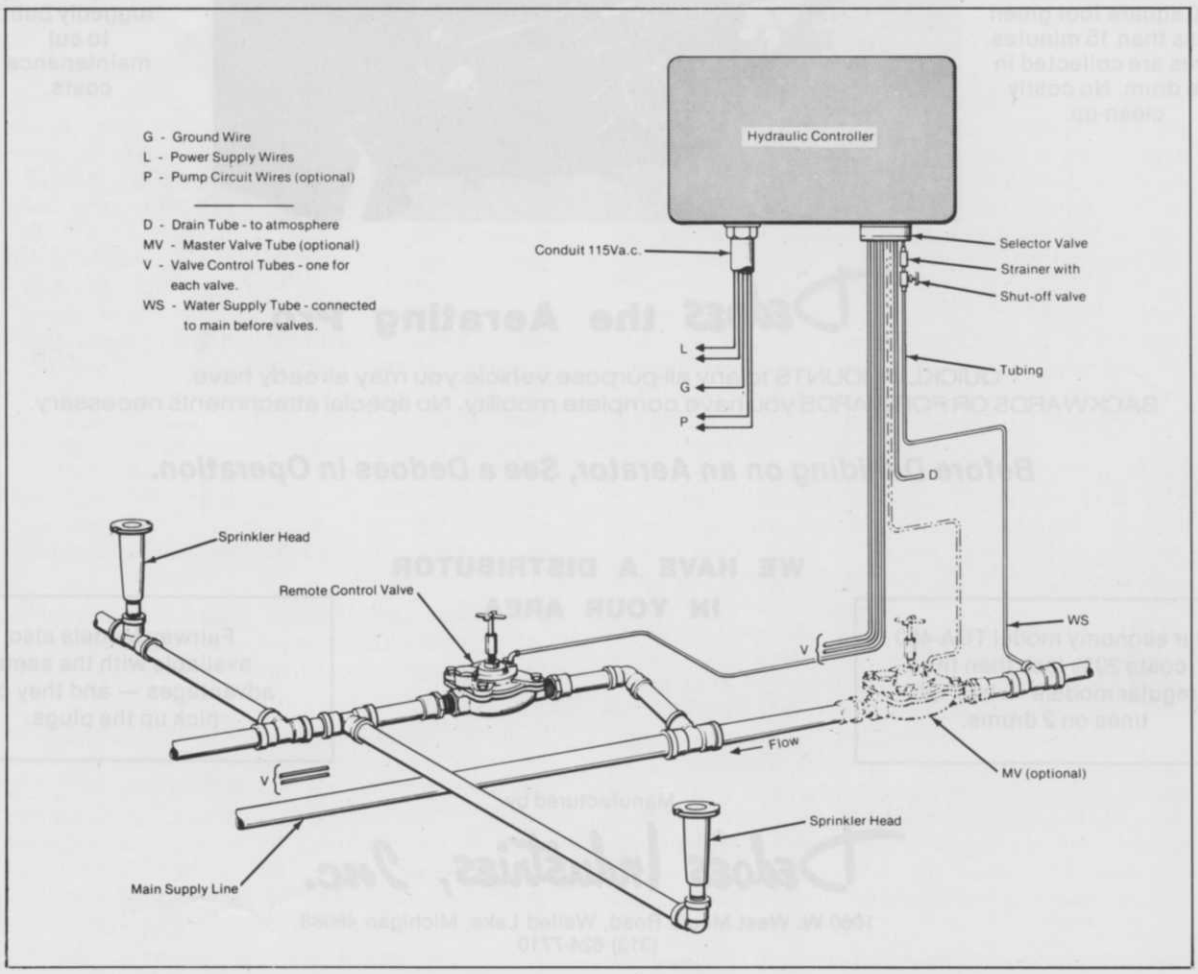
When a valve is not being operated (Figure 14, closed position), water under pressure from the sprinkler system "main" pipe line holds the valve closed.

When a controller "station" wired to a valve energizes the solenoid, the magnetic force lifts its actuator off the exhaust port. The pressure of water in the upper (hydraulic) chamber is relieved through the exhaust port which allows the "main" pipe line pressure to force the flexible diaphragm up, opening the valve. (Figure 14, open position).

Because a loss of water pressure occurs as water flows through the body of the valve, pressure is greater at the entrance of the inlet port to the upper chamber than at the chamber outlet port. The sizes of the two ports are correlated so water can flow out the exhaust faster than it can enter the upper hydraulic chamber. Therefore, service technicians should be cautioned to never tamper with

Figure 14: Electric solenoid diaphragm valves, open and closed.

Figure 15: Tubing installation for a hydraulic controller.



the port sizing for any reason.

When the controller "station" and solenoid are deenergized, the actuator drops, closing the exhaust port. Pressurized water entering the upper (hydraulic) chamber forces the diaphragm down, closing the valve.

Sprinkler system water must be clean of debris that could cause the inlet port to be blocked. If this should happen, water could not flow into the upper (hydraulic) chamber and the valve would remain open. Some valves use an inlet port strainer to keep out larger debris. However, screens can be blocked by build-up of fine debris.

Other valves utilize an inlet port directly through the diaphragm. Large debris that could block the port is normally dislodged as the diaphragm flexes during valve opening and closing. Debris smaller than the inlet port is free to pass through. Since the outlet port is larger than the inlet port, any debris passing through the inlet port will pass through the outlet port.

Operation: Electric Thermal Motor Valves. While wiring requirements are the same as for "Electric Solenoid Diaphragm and Piston Valves," the principle of valve operation is completely different. The valve is made on the straight-globe pattern.

When the valve is not being operated, a strong spring forces the seating disc against the body seat, holding the valve closed. A shaft is attached at the bottom to the seating disc and at the top to the motor.

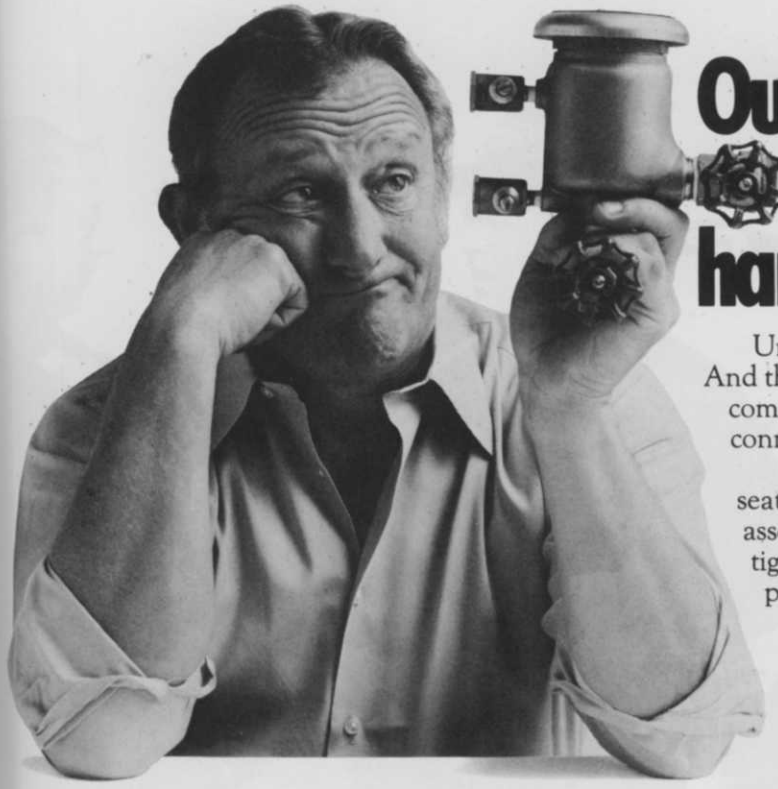
When the valve is electrically energized by the controller, the motor extends the shaft forcing the seating disc away from the body seat, opening the valve.

When the controller "station" is de-energized, the valve spring forces the seating disc against the body seat, closing the valve.

Normally-Closed. Electric remote control valves are a "normally-closed" type. This definition means that should the electricity to the valve be interrupted for any reason, such as a power failure, broken wire, etc., the valve will automatically close itself. This feature is of considerable importance.

HYDRAULIC AUTOMATIC SYSTEMS. Turf sprinkler systems using water as the "actuator" for remote valves are classified as "hydraulic automatics." Hydraulic controllers apply or release water pressure through "hydraulic tubing" to the hydraulic remote valves. There is more than one method by which the controller operates remote valves. However, since all are quite similar only the most commonly used method is outlined in detail.

Tubing. Pressurized water is brought into the controller by a tube connected to the "main" pressure pipeline of the sprinkler system. This tube must be connected to the "main" in front of all remote valves. Occasionally, an independent water source



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with pressure as great or greater than that in the system is used.

Water pressure is applied, or released, through tubes connected between the controller and the remote valves. The individual "stations" control this function with a special "selector" valve; or with a bank of individual small, electric solenoid valves commonly referred to as "pilot" valves.

As shown in Figure 15, a separate control tube is required for each "station" to operate its valve or valves. Control tubing, often referred to as "hydraulic" tubing, is usually small — ¼ or ⅜ inch nominal size — and flexible soft-annealed copper or plastic. Always check equipment manufacturer's recommendations for size. Also, larger tube may be required when one tube controls more than one valve.

Operation. In the non-operating position, pressurized water from the supply fills the supply tube and valve tubes through the open selector valve or the individual, 3-way solenoid pilot valves. This pressure forces the diaphragm (or piston) seating disc down and against the body seat, holding the valve closed. (Figure 14, closed position).

When a controller "station" activates the selector valve, the water supply to the remote valve controlled by that "station" is shut off and pressure in its control tube is relieved through a drain tube. (Figure 16, open position.) Relieving pressure in the control tube also relieves pressure in the upper

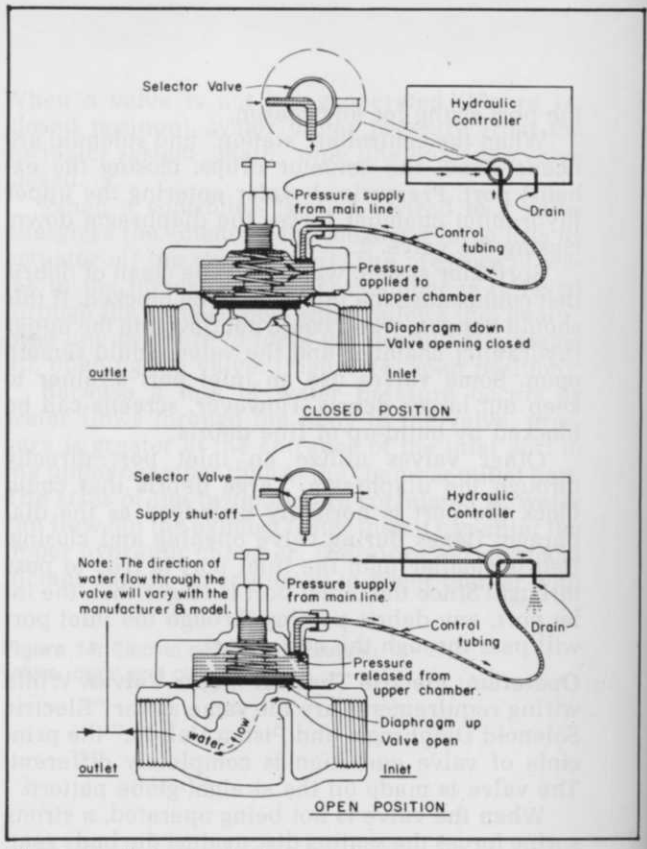
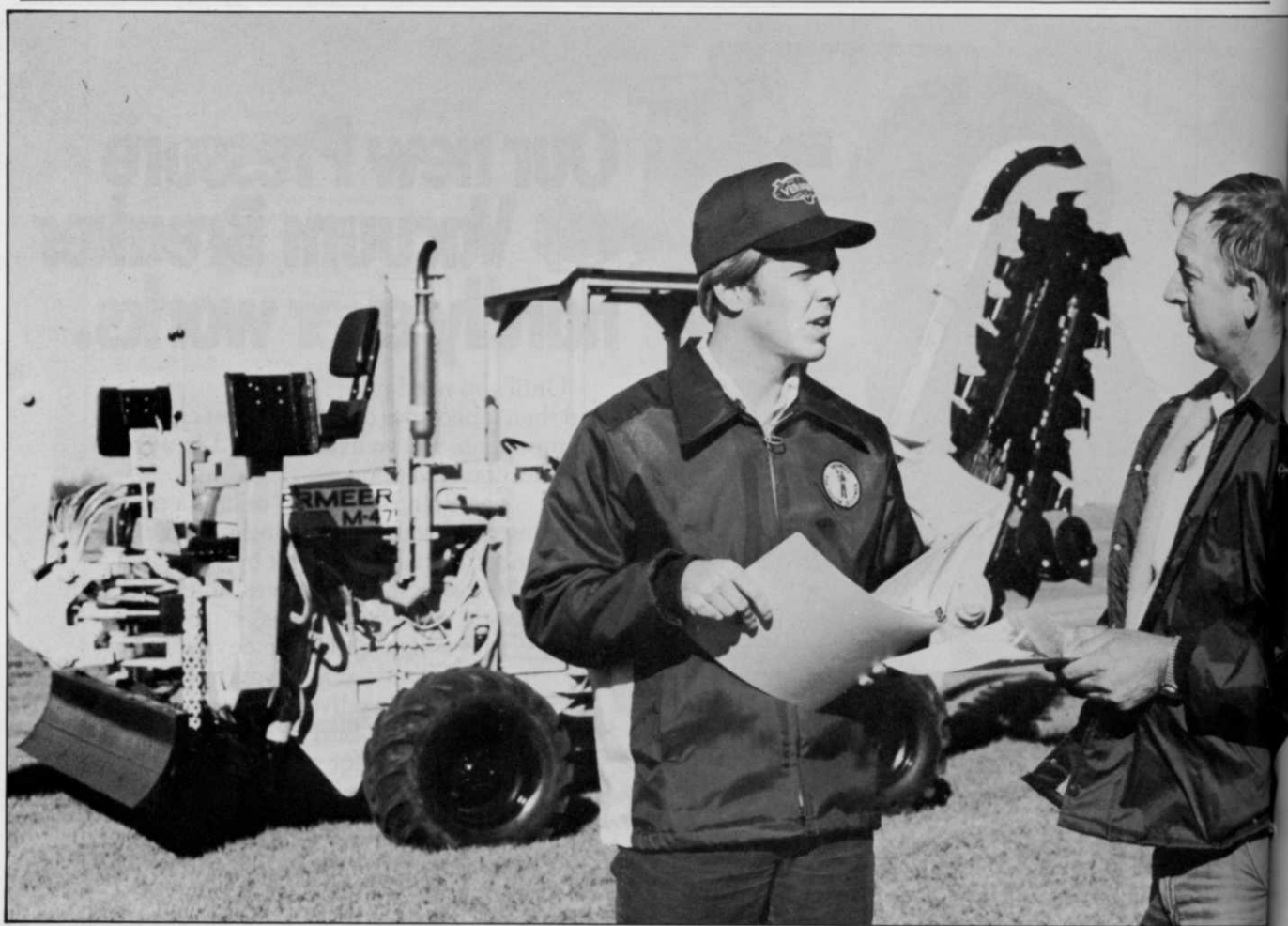


Figure 16: Hydraulic diaphragm valve, open and closed.



(hydraulic) chamber of the remote valve. Pressure in the sprinkler system main supply pipe forces the diaphragm (or piston) up, opening the remote valve.

When that "station" is de-activated, the process is reversed and pressure in the control tube forces the diaphragm (or piston) down, closing the valve. (Figure 16, closed position).

Alternate Method of Operation. In one of the other methods of hydraulic automatic systems operation, the pressurized water (from the upstream sprinkler main line) required to close remote valves enters the upper hydraulic chamber of the valve through an internal port. These inlet ports are located exactly the same as those in electric diaphragm valves; either through the valve body or the diaphragm. In piston valves, the port is through the center of the piston.

To operate, two-way selector or pilot valves are used to relieve the pressure in the upper (hydraulic) chamber. This allows the system pressure to force up the diaphragm (or piston), opening the valve. During system operation, there is a constant small bleed of water through the common drain tube of the controller. This bleed tube is commonly serrated every few inches and buried in a shrubbery bed. It can also be connected to a shrub head, if desired.

When the pilot valve in the controller closes, water pressure again builds up in the upper (hydraulic) chamber of the valve, closing it.

Clean Control Water. The water used to operate remote valves in a hydraulic system must be clean. Most manufacturers specify that a strainer be installed in the supply tube to the controller to avoid clogging of the pilot valve (or valves). Such clogging can prevent the supply of pressurized water to the remote valves, in which case they would not close.

Controller Freeze Protection. Hydraulic controllers must be protected against any freezing, if the control tube and/or valves are located in the controller. Also, when the earth freezes to the depth of buried tubing, all tubing must be drained. The small control tubing cannot be drained with the normal methods of draining system piping. The only successful way of removing water from the control tubes is to blow it out with an air compressor.

Special Note. Unlike electric automatic systems, when the "actuator" source to the hydraulic remote valves — pressurized water — is interrupted, the remote valves will open and remain open until pressure is returned. Such failure can be caused by a leak occurring in the control tube, a break in the tube, or a clogged or malfunctioning pilot valve. **WTT**

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BOARD VIEWS BUSINESS SKILLS, COMMUNICATION AS KEYS TO GROWTH

Dale K. Manbeck

Dale K. Manbeck has been president of Manbeck Nurseries, Inc., in New Knoxville, Ohio, since 1971. He is also serving his second term as president of the National Landscape Association.

Manbeck received a Bachelor of Science in Landscape Horticulture in 1965 from Ohio State University, Columbus. He has always specialized in the business aspects of landscaping and nursery management.

In addition to his role at NLA, he is past president of the Ohio Nurserymen's Association and is a member of the Member Development and Dues Committee of the American Association of Nurserymen. Manbeck is also on Ohio State University's Citizens Advisory Board and the St. Marys City Board of Education.

He lives in St. Marys, Ohio, with his wife and two children. Hobbies include racquetball, tennis and golf.

The future of the nursery industry, I feel, is very bright. As we move forward the demands on our business will continue to increase partly from the government (taxes, reports, consumer groups) and partly from the management needs of our own businesses.

Not long ago, it was felt that to succeed in our industry the most important factor for success was to be a good plantsman, however, I do not believe this to be as important as management skills. We must know what our costs are and be able to fiscally manage them as well as to project them into the future.

Under management we must consider personnel management and the important part it plays in our organizations. Don't misunderstand, knowledge of plants is still important and will continue to be as the consumer becomes more and more aware of what they want from us. Proper management will help us serve our clients more professionally.

As we pursue the discretionary dollar, which we must do, we as individuals and organizations have an opportunity to participate in an advertising program that will help us achieve that goal. The Nursery Marketing Council is being initiated by the American Association of Nurserymen. The Nursery Marketing Council is established to supply the nursery industry with professional market research and analysis and the resulting advertising and public relations to increase the sale of plant materials and related products. The Nursery Marketing Council is funded solely by voluntary contributions of the retailer and wholesaler together. Its activities are performed for the benefit of the entire nursery industry and those businesses that serve to support and enhance nursery products.

This will have a very positive impact on our industry and its continued growth.

Roger Funk

Roger Funk, Ph.D., is director of research for the Davey Horticultural and Lawnscape Institutes, both divisions of Davey Tree Expert Co., in Kent, Ohio.

Funk holds the patent for Arbor Green, a slow release organic fertilizer for hydraulic application, and is credited for a no-drift nozzle used by lawn care companies.

He received his Ph.D. from West Virginia University in 1973. Funk is active in many state turf associations and is often a speaker on their programs. He is also a member of the International Society of Arboriculture, the International Horticultural Society, and the Institute of Biological Sciences.

It is our opinion and conviction that the arborist industry has, particularly in the last ten years, experienced a gradual and progressive upgrading of standards resulting in a high degree of professionalism. Horticultural science and research has developed technology to assure quality materials and procedures for the health, vigor and remedial care of trees and shrubs. Engineering has continued to improve tools and all types of power equipment in our industry to achieve greater production and improved safety to the workmen with no sacrifice to quality.

Government regulation has been costly to companies but has increased safety and quality standards. The Occupational Safety and Health Act (OSHA) established safety procedures and equipment that all companies must use. Federal pesticide regulations as well as state licensing of companies and certification of applicators has provided a standard base of technical understanding and responsibility for the industry.

Personnel development has been established as a key requirement by all governmental agencies engaged in horticultural services with excellent study material and instructors involved in seminars and work study programs. In the educational section, it has been our observation that colleges are improving on the curriculum to assure that graduating students have both theoretical and practical application backgrounds.

Perhaps the greatest challenge for the future is increased communication among the various segments of the arborist industry.

Although the governmental regulatory agencies have established environmental and safety standards, these agencies cannot do their jobs without cooperation from the industry. Arborists must work with university and industry scientists to coordinate research with the needs of the field personnel. Companies should also encourage personnel to participate in the various training programs and symposiums to improve their knowledge and performance.

The time and monies expended in research and training and in complying with government regulations represent an investment in quality service to the public — the goal we should all be working toward.

Robert Felix

Bob Felix is the executive secretary of the National Arborists Association.

As a student at Adelphi University he helped develop Harder Tree Service. He eventually became executive vice president and controller of the company which owned and operated three tree service companies in the New York/New Jersey area.

In 1972, Felix was elected president of the National Arborist Association and in 1974 he became the full-time executive secretary of the group based in Wantagh, NY. Felix is also a member of the International Society of Arboriculture, American Society of Consulting Arborists and the New York State and Long Island Arborist Associations.

He is married, has three children, and resides in Wantagh, NY.

Our industry is very healthy. Our market is bigger than it ever has been and is growing. Our sales are increasing in real dollars as well as inflated dollars. From the information available to me, it would seem that profits have increased proportionately.

In the private sector of tree care there is a tremendous increase in the degree of sophistication of management. This recent manifestation extends from marketing to business practices. Our professional arborists are offering full service tree care and making their clients aware of it.

Our utility tree trimming contractors are also experiencing real growth. Sure, the competition is tough but hasn't it always been? Every utility contractor I have spoken to speaks of putting on more crews.

Our industry is also in quite a transition. Thirty years ago, most commercial arborists, and certainly most NAA members were members of the Davey Alumni Association operating, for the most part, small to medium size companies. They were purists, somewhat unsophisticated, but dedicated, determined individuals. Many of them have been quite successful both as arborists and businessmen. Their achievements are well known to many. They have been the backbone of this industry.

However, a younger generation is now making its mark in the management of our industry. They, too, are alumni but from a variety of companies. Some from colleges and universities. Our industry is also attracting people whose training has not been in arboriculture or horticulture. We have C.P.A.'s, attorneys, investment bankers, business administration majors, and the like, swelling the ranks of the management of tree care companies.

Our newer managers are not necessarily purists. They tend to be more opportunistic, venturing into other areas of the green industry or totally different fields. We find arborists in the lawn and landscape industry, of course, but we also have some in interiorscaping, environmental reclamation and horticultural products distribution and sales. We have one member who leases and sells recreational vehicles, another who owns a boat building company and one who owns a hotel.

This diversification has not diluted the level of professionalism one bit. The quality of the work being done today is as good as it ever was. In fact, the search for knowledge, the willingness to experiment and the desire to upgrade the quality of work done by employees increases every year.

Needless to say, we also have our problems. I have some specific concerns in this regard. I'm concerned about the small and medium sized companies endeavoring to get into utility trimming.

There seems to be a feeling that this is where the money is, no hassle with hundreds of individual customers and no need to train proficient climbers. Not true!

I'm concerned about the heavy investment by medium sized companies in new equipment because a utility asked for another crew. I'm very concerned about the fact that this "catch up" game that the utilities are playing might suddenly disappear. Then what will you do with that expensive piece of equipment?

I'm concerned about production personnel. Historically, when things in our industry have been good, there has never been enough men. That hasn't changed, but the segment of the labor market from which we can draw trainees is narrowing all of the time.

Our price structure has not been accelerated enough to keep pace with increased minimum wages, unemployment benefits and other government subsidized programs. We must be constantly aware of the need to anticipate not only rising labor costs but rising costs for benefits, insurance equipment, gas, oil and those indirect expenses that never seem to be able to be cut down.

I'm also concerned about research for our field. There is a great deal of research being conducted on tree problems but the results of this research don't get to the right people or enough people. How much research is being duplicated? How much do we never see? **WTT**

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *I am receiving a large number of calls from customers about losses to trees by recent ice storms. Those who don't have insurance to cover the losses ask about a Federal income tax deduction. What are the facts on such occurrences?*

A: The expense of removing, repairing, and replacing damaged trees, shrubs and evergreens is deductible if properly documented and not covered by insurance. It is important that the homeowner have a qualified horticulturist do the work and estimate damages. IRS may not honor the deduction without documentation from a tree expert in case of an audit. The expert can also determine for the homeowner whether or not a damaged tree is beyond repair because of storm damage.

As far as repair, reshaping, bracing, cabling, and fertilization must be properly recorded on invoices for the work.

The key words are "restored to the same approximate value as before the damage occurred." An appraisal may be important for cases of severe or wide-spread damage, since the value of the property lost may exceed the removal, repair, and replacement costs. IRS requires immediate appraisal by a recognized expert with photographs.

Who is a qualified expert? IRS recognizes members of the International Society of Arboriculture, the National Arborist Association, the American Association of Nurserymen, the American Society of Consulting Arborists, and the Associated Landscape Contractors of America.

Q: *I am groundskeeper for a corporation which does chemical and pesticide toxicity studies and related research. I need an herbicide for weed control around the buildings which is non-volatile and cannot enter the labs through the air exchange units. I must be certain that any chemical I use cannot enter the labs or any part of the building and present itself as a variable in the research being conducted there. What can you recommend? This must be a broad spectrum weed control program for use in bluegrass-ryegrass turf areas.*

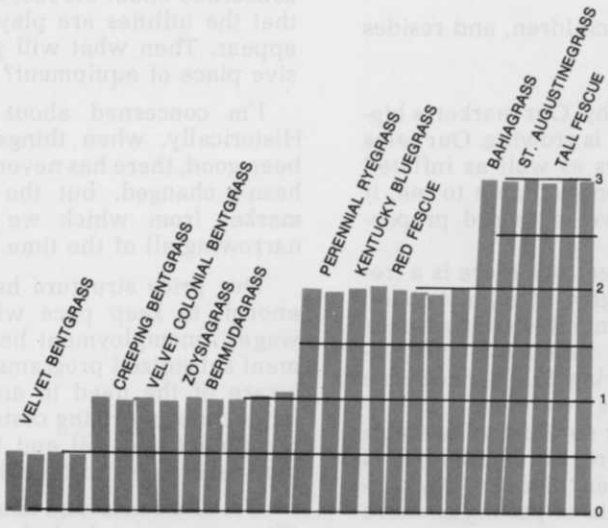
A: I cannot guarantee that any of the recommended herbicides will not enter the air ducts, but I can recommend materials and methods to minimize the potential.

If your laboratory is not utilized on weekends, I suggest that you close off the air exchange units, if possible, and apply the herbicides on a weekend.

If your main concern is plantain, dandelions, etc., an amine formulation of 2,4-D will suffice. If you also have vining weeds (ground ivy, veronica, etc.), you should include an amine formulation of Dicamba and/or Mecoprop. There are several brands on the market. Be sure to get amine formulations, which are relatively non-volatile.

Apply the chemicals low to the ground when the wind velocity is below 7 mph and the expected day temperature is below 85°F. Do not apply the material any nearer the air ducts than absolutely necessary. You may even consider hand-weeding in front of the ducts.

Maintaining a thick turf will minimize the need for future herbicide applications.



Recommended mowing heights for various grasses. A good rule of thumb is don't mow more than one third of the grass height in any one cutting. More frequent mowing may be required to avoid unusual stress on the grass plants and to achieve the most attractive results.

GREEN INDUSTRY NEWS

Continued from page 14

1978 officers for the Virginia Turfgrass Council are: (front row, left to right) Rex H. Harris, Eagle Haven Golf Course, assistant treasurer; Earl H. Odell, Todd Farm Equipment Co., secretary-treasurer; Gus C. Constantino, Wilson Feed & Seed Co., president; Charles Moss, Richmond Power Equipment Co., director; (back row) directors: George C. Baker, Dixon & Van; Stephen P. Skowronski, Meadowbrook Country Club; Archie Goode, Brookside Golf Club; Richard J. Fisher, Lake Monticello Country Club; and W. Ray Weekly, Prince William Turf Farms. Kenneth P. Giedd, Hermitage Country Club, vice president was not present.

Virginia turfgrass show draws 280 delegates

The 18th annual Virginia Turfgrass Conference drew 280 persons this year, in spite of the weather. The conference is sponsored each year by Virginia Tech's Extension Division and the Virginia Turfgrass Council. With "Emerging Trend for Better Turf" as the theme this year, the conference was attended by golf course superintendents from Washington D.C. and Williamsburg, National Park Service officials, and maintenance personnel for the marine base at Quantico, among others.

The Virginia Turfgrass Council presented its R. D. Cake Memorial Award to Lee Dieter, superintendent of the Washington Golf Course at Arlington, Va. Dieter is a past president of the council and the Mid-Atlantic Association of Golf Course Superintendents. He is a Pennsylvania native and 1959 graduate of Penn State.

The industry service award went to Richard E. Schmidt, associate professor of agronomy at Virginia Tech and director of the Turfgrass Research Center. A native of Michigan, Schmidt joined Virginia Tech in 1960 as an instructor after completing his bachelor's and master's degrees at Penn State. His doctorate came from Virginia Tech in 1965. He has directed research at the center since its founding in 1967. The award recognizes his nearly two decades of turf research.

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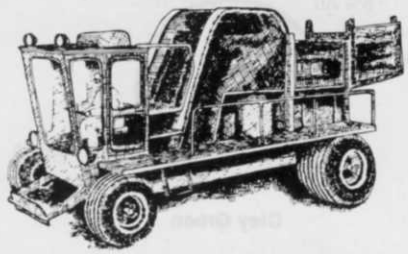

That's right! With Princeton's "Automatic" Sod Harvester you can harvest up to 27,000 sq. ft. of sod per hour...all by yourself. Eliminates the need for a large field crew. Save time, money, and man-hours.

Designed for large volume sod producers who want to increase production **and** profit. Cuts, aerates, crosstie stacks and palletizes sod...ready to ship, automatically. All you do is steer!

No matter how large your volume...**all you need** is a Princeton "Automatic" Sod Harvester... and **maybe** a radio for company.

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Reduced costs and increased production means bigger profits. That's why the Princeton "Self-Propelled" Sod Harvester has become the standard for the sod industry. Compare output! Three men and one machine can harvest 22,500 sq. ft. of sod per hour, completely palletized.

For the medium to large volume sod producer who wants quality, high production, and low maintenance at a moderate price.

Models available for various soil and harvesting conditions.

Designed to meet the special needs of the smaller volume sod producer. Operates behind any adequately sized, low-speed tractor. Exclusive "2 minute hook-up" capability allows you complete flexibility in the use of your power supply. With a 3 man crew, you can harvest up to 13,500 sq. ft. of sod per hour, palletized and ready to ship. The "Tow-Boy" Sod Harvester...own a **real** Princeton at one third the cost of our larger machines.

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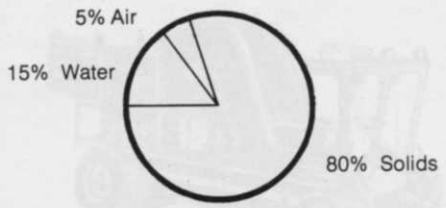
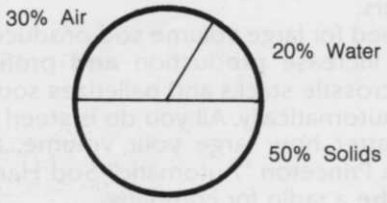
PROSCAPE

By Michael Hurdzan, Ph.D., golf course architect and consultant



Clay Green



Green Mix

Q: *What would you suggest for sand topdressing to correct clay greens in a heavy rainfall climate?*

A: If you really want to correct your clay greens, you should rebuild them. If you don't want to rebuild, you can try methods of improving clay greens which may reduce the severity of the clay/high rainfall problem.

Basically, the small size and shape of clay particles allow them to fit so closely together that the space between the particles is very small. Only marginal amounts of nongravitational water and air are held by the green to support plant growth.

In preparing green mixes, we try to achieve 30 percent air spaces, 20 percent water spaces, and 50 percent solids after the green has been compacted, soaked, and allowed to dry 24 hours. To achieve this mixture, silt and clay particles are excluded in most instances resulting in essentially soil-less greens composed of only sand and organic matter. Furthermore, excess water from rainfall or irrigation should be able to percolate downward to be carried off by drain tile placed in the green subgrade on 15-ft. centers.

To dilute the effects of clay requires massive amounts of sand. Your program should be geared to applying as much sand as possible without injuring the existing turf. Your greens will not need additional organic matter if you have any mat layer at all.

In the cool times of the year aerify with as large of tine as possible and to the greatest depth possible. Remove the plugs and topdress with pure washed, medium sand [particles 1 mm or smaller). Apply roughly ⅛ in. of sand each time you topdress and aerify. Brush the sand into the holes and thatch layer. Do this as often as possible during the cool, actively growing periods. During hotter periods of slow turf growth, carefully topdress every three weeks or so with about 1/16 in. of plain sand.

Continue to aerify and topdress with sand until a six to eight-in. layer of sand has accumulated. This may take many years. Many superintendents have found a rotary, pull-behind fertilizer spreader equipped with a sand ring insert as a good way to apply the sand.

Heed these points of caution:

—sand must be proper size,
—sand should be neutral to slightly acid pH,
—apply adequate micronutrients,
—adjust watering practices as sand builds up,
—only apply as much sand as can be worked into the mat layer,
—topdress only when turf is actively growing.

The Tee-2-Green Corp., 1212 W. 8th St., Kansas City, Mo. 64101, has a free publication on sand topdressing available. Titled "Problems or Progress," it can be a great aid to any greens chairman considering a sand topdressing program. **WTT**

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TOUCHDOWN
Kentucky bluegrass

PLANT VARIETY PROTECTION CERTIFICATE No. 7400066

POA ANNUA... FINALLY MEETS ITS MASTER

. . . University of Illinois at Urbana-Champaign

Dr. A. J. Turgeon and co-workers J. E. Haley and J. R. Street conducted intensive Kentucky bluegrass cultivar management studies.

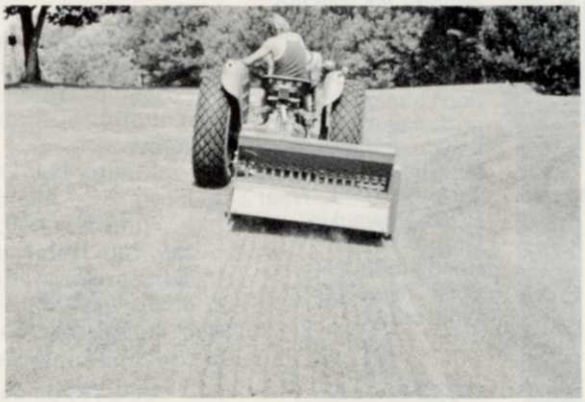
Twenty-one cultivars were planted in September 74. Varying management regimes were imposed to measure their competitiveness against the infestation of Poa annua.

They concluded: *"The most impressive differences among cultivars were observed under close mowing (0.75") and high fertilization (8 lb./N per 1000 sq. ft.). Several of the cultivars were virtually overrun by Annual bluegrass while others remained nearly weed free. Those cultivars which are apparently best adapted to this cultural intensity include A34, Brunswick and Touchdown".*

Touchdown fights Poa annua two ways:

First — its superior disease resistance means it won't thin out from Crown rot (Leaf spot) Leaf rust, Stripe smut or today's Fusarium so Poa can't get a foothold . . . and secondly it's so aggressive and dense in growth habit it just keeps on fighting Poa.

Touchdown is ideal for overseeding . . . it germinates fast and quickly develops a healthy, mature turf.



Let's look again at what Touchdown has for you:

- early spring greenup
- rapid establishment
- drought and heat tolerant
- dwarf growth habit
- superior disease resistance
- bright green color

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Circle 155 on free information card

PRODUCTS

MODEL HA ROTAVATOR is in full-scale production by the Howard Rotavator Co. The new 70-inch variable offset model, designed for tractors in the 25-50-hp range, is expected to become popular for applications where a tool is needed that will work close to trees, without damaging lowhanging branches. It can be switched from offset to a central mounting position by turning a handscrew.

Model HA7OG/VO comes with Howard's "Selectatilth" gearbox, providing a choice of 165, 190, 210, or 235 rpm rotor speeds. Other versions are available in tillage widths of 40, 50, 60, 70, and 80-inches. Depth is accurately controlled to protect tree and vine roots.

Circle 701 on free information card

RYAN EQUIPMENT COMPANY is introducing a new self-propelled turf aerator, weighing 150-lbs. The 3-hp unit is reported to be 60 percent lighter than previous coring aerators built by Ryan.

The aerator features a drainable 6.6-gallon capacity barrel to increase aerating weight by 55 pounds when filled with water. The barrel, treated to inhibit rust, is located slightly ahead of the tines to provide coring penetration up to 2½-inches deep. The machine can aerate up to 150 ft. per minute in 19-inch swaths under normal conditions, according to Ryan.

Circle 702 on free information card

FERRARI INTERNATIONAL has announced the heavy duty Model 85 four-wheel-drive, low profile tractor. Forty inches high at the hood, the 45 hp tractor was three years in development. It features four wheel hydraulic brakes, with dual safety system, power articulated steering, two locking differentials, two P.T.O. shafts, one high and one low for easy hookup to all standard three-point hitch implements, seven forward gears and three reverse, and a convenience cluster of all levers for the driver.

Standard tires are 15.50 x 15 high flotation. A bonus feature allows the tractor to be equipped with 9.50 x 15 tires, giving it a width of 40 inches, for narrow row work.

Circle 703 in free information card

THE BROYHILL COMPANY is now marketing a G.P.M. meter accurate within one percent. The meter can instantly provide gallons per minute from which can be determined gallons per acre for sprayer and liquid fertilizer application. Meters can also be purchased with gallon accumulators for total gallons used. Other applications are monitoring plugged and worn nozzles, loss of pump prime, pressure, or empty tank. Calibration becomes simpler. Total cab control is available with the RC-1 remote boom solenoid control unit.

Circle 704 in free information card

CLASSIFIEDS

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

HELP WANTED

INSTRUCTOR/ASSISTANT PROFESSOR Plant Science: Teach such horticultural courses as Nursery Culture & Operation, Arboriculture, Landscape Design, Landscape Construction & Maintenance, and Woody Plants. Willingness to teach evenings, possible summer teaching. Assist in arranging summer work experience for students. Qualifications: Master Degree in Plant Science with strong leaning toward practical applications; 3 years of commercial or other field experience in plant science. Application deadline June 16, 1978: position begins September 1, 1978. Contact Dr. Lewis Roberts, Jr., Thompson School of Applied Science, Barton Hall, University of New Hampshire, Durham, N.H. 03824. The University is an Affirmative Action/Equal Opportunity Employer.

CITY FORESTER — Beautiful town of 21,000 in residential New Jersey requires graduate municipal forester with supervisory experience. Responsibility for Shade Tree Department, park, recreational and school grounds maintenance. Send resume in detail to Box 196, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

PARK MAINTENANCE SUPERVISOR — Pasadena, California (population 113,-000). Salary — middle $20,000 annualy. Requires B.A. in park management/administration or related field, four years of progressively responsible experience in park or landscape management, two years of which must have been in a supervisory capacity and possession of California driver license. (Two years additional related experience may substitute for up to two years of education with an A.A. in park management/administration). Landscape management experience must include knowledge of proper use and control of pesticides and herbicides, maintenance of turf, trees, and shrubs, and of irrigation systems. Apply immediately to Personnel Department, City of Pasadena, 100 N. Garfield Avenue, Pasadena, California 91109. Phone 213 577-4366.

SUPERINTENDENT: A quality midwest cemetery organization requires the services of an outside man with leadership experience of at least 5 years to supervise land development, maintenance of turf, nursery materials, buildings and fleet equipment and handling of interment services by personnel. 100 acres, half developed; populatio of community 400,-000. The individual will do his own hiring and earn $15,000 to $20,000 per year depending on qualification, plus full employee benefits. Please send resume in detail to Box 190, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

ASSISTANT SUPERINTENDENT or grounds foreman: Attractive memorial gardens located in north midwest has an excellent opportunity for an experienced assistant superintendent or a grounds foreman. Applicant should have a minimum of five years cemetery experience and at least two years in a supervisory position. All inquiries strictly confidential. Please send resume to Box 191, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

Continues on page 68

BUNTON

The Bunton Breed

Introducing the 36 inch cut Bunton Rear Discharge mower. A new design deck allows close trimming on both sides, helps prevent windrows and gives you a clean manicured cut (not that just-cut look). The new variable speed drive gives a wider range of ground speeds. The 3 gallon fuel tank and Hi-Way front caster wheels are standard equipment. This new mower is designed for fine lawns and rough areas. The finger tip control gives the same easy handling and hillside stability and maneuverability as the other Bunton Self-Propelled models. Also available is a new 52 inch rear discharge mower.

Bunton Co. • 4303 Poplar Level Rd. • Louisville, Kentucky 40213 U.S.A.
Phone 502/459-3810 Telex 204-340

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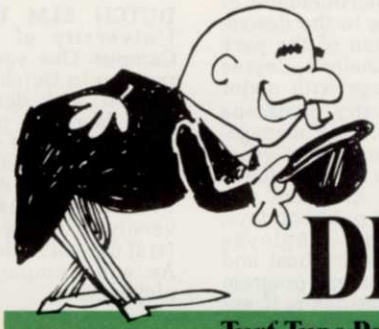

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Derby is the dark green beauty which joined Manhattan and Pennfine on the "highly preferred list of ryegrasses." That was last year. Now Derby is setting a new standard of excellence. In the eyes of many Golf Superintendents it reigns supreme among the turf-type ryegrasses today. Why? Because it performs! And performance counts.

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Telephone (503) 369-2251 • TWX 510/590-0765

Circle 104 on free information card

FORESTER: Responsible position assisting the City Forester in the care, supervision and maintenance of trees on city streets, boulevards, and public areas. Requires a bachelor's degree from an accredited college with major course work in horticulture, forestry or a related field. Training in urban forestry is desirable. Excellent employee benefits including paid holidays, sick leave, and vacation, employee hospitalization plan, major medical and life insurance, City retirement program and Credit Union. Non-residents, if appointed, must agree to establish residency within the city limits of Kansas City, Missouri. Salary range $1008.00 to $1285.00 per month. Equal Opportunity Employer. Apply by June 2, 1978 to: Earl Unell, Personnel Department, 12th floor, City Hall, Kansas City, Missouri 64106. (816) 274-1228.

OPERATIONS MANAGER — must have experience in planning, scheduling, and supervision of field crews, preferrably in non-agricultural herbicide application. Other responsibilities: personnel function and overall equipment maintenance. Considerable travel within 4-state territory required. Unlimited opportunity with growing herbicide application firm, doing business primarily with state and county highways and utilities. Contact: Lex Dalton, Dalton Gang, Box 246, Warsaw, Indiana 46580.

LANDSCAPE ARCHITECT II Responsible professional landscape architecture position assisting the Superintendent of Forestry and Landscaping in the design, development and operation of the park system. Requires a bachelor's degree from an accredited college with major course work in urban forestry, landscape architecture, horticulture, park management or a related field and three years responsible experience in the practice of one of the above fields. Excellent employee benefits including paid holidays, sick leave and vacation, employee hospitalization plan, major medical and life insurance, City retirement program and Credit Union. Non-residents, if appointed, must agree to establish residency within the city limits of Kansas City, Missouri. Salary range: $1204.00 to $1711.00 per month. Equal Opportunity Employer. Apply by June 2, 1978 to: Earl Unell, Personnel Department, 12th floor, City Hall, Kansas City, Missouri 64106. (816) 274-1228

SUPERVISOR OF FLORICULTURE Responsible position supervising the floriculture programs which include the greenhouse and garden center operations and care of plants and flowers throughout the municipal park system. Requires a bachelor's degree from an accredited college with major course work in horticulture, botany, soils, or floriculture and five years experience in greenhouse plant propagation, production, research, and ornamental display and related floriculture work. Excellent employee benefits including paid holidays, sick leave and vacation, employee hospitalization plan, major medical and life insurance, City retirement program and Credit Union. Non-residents, if appointed, must agree to establish residency within the city limits of Kansas City, Missouri. Salary range: $1110.00 to $1487.00 month. Equal Opportunity Employer. Apply by June 2, 1978 to: Earl Unell, Personnel Department, 12th floor, City Hall, Kansas City, Missouri 64106. (816) 274-1228.

BRANCH MANAGERS: Chemical Lawn Care Currently 17 Florida locations, year around operations. Branches range in size from 1 to 15 trucks. Agronomic background helpful but not necessary. Paid training programs, Pension and Profit Sharing Plan. Send resume in confidence to Florida's largest chemical lawn care company. R. W. Collins, Inc. Attention: R. W. Collins, President, P.O. Box 2477, Satellite Beach, Florida 32937.

BRANCH MANAGER — National automated lawn service presently in franchise market seeks experienced individual to start and head up company areas. Tremendous growth potential for one presently with liquid spray management experience. Send confidential resume to Lawn Doctor, Inc., P.O. Box 186, Conover Road, Wickatunk, N.J. 07765.

LANDSCAPE GARDENER — Growing landscape company requires gardener who is familiar with general maintenance procedures to maintain landscaping on established routes. Call 213 787-0338.

LANDSCAPE FOREMAN — Wanted landscape foreman for commercial landscape company. Must have previous experience. Call 213 787-0338.

DUTCH ELM DISEASE SPECIALIST. University of California Berkeley Campus. One year (possibly renewable) position in Dutch elm disease control extension and demonstration. Minimum M.S. degree in plant pathology or entomology and one year of appropriate experience required. Refer to #7810. Contact Personnel Administrator, Cooperative Extension 331 University Hall, University of California, Berkeley, CA 94720. (415) 642-0343. Closing date: May 26, 1978. An equal employment opportunity employer M/F.

FOR SALE

HYDRO TRAVELER hydraulic-engine irrigator covers 20 acres a day with only 2 hours labor. Dozens of features, yet at the price of a water-drive! Write or call for illustrated brochure. Hydro Engineering, Inc., Dept. WT-5, Box 98, Young American, Minnesota 55397. Phone 612 467-3100.

1966 FITCHBURG CHIPPER, dismantled, best offer; 1964 John Bean sprayer, 60 gpm, 600 gallon tank, Hannay hose reel included, Willy's engine, $2,000; Lehman Tree Experts, 516 484-4490.

MAKE BIG MONEY with biggest efficient tank truck sprayer, 1800 gallon, livetime, double stainless oval tank with insulation, 60 G.P.M. high pressure F.M.C. pump, Wisconsin engine and more. Doubles as water or chemical tanker or other uses. Save now. Paul Bunyan Mfg. 603 Union Road, R2, Lebanon, Ohio 45036. 513 424-2052.

FOR SALE — Complete tree service company 23 years in business New England area. Equipment modern and good condition. Excellent clientele. Box 192, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

FOR SALE: Landscape contract business. Snow removal in winter. Can be bought on contract for deed. Write to: Morris Landscape Contractors, Stonehedge, Winona, MN 55987.

USED EQUIPMENT

2 — 50' AERIAL BASKETS, brush chipper, stump cutter, 2 sprayers, small crane. Parkway Tree Service, 12026 West Cherry St., Wauwatosa, Wisconsin 53226. 414 257-1555.

FOR SALE — 1975 Vermeer TS-22" tree spade. Mounts on Bobcat or 3 pt. hitch. Excellent condition. $1800.00. 1976 Care tree 30" tree spade. Mounts on Bobcat or 3 pt. hitch. Mint condition. $2995.00. 1976 Care tree 36" tree spade. Mounts on 990 Bobcat, tractor, loader, or dozer. Mint condition. $4495.00. 1972 Vermeer TS-44T tree spade on 1974 GMC 1 ton. New spades. Good condition. $7800.00. Will send photographs upon request. Call or write: Spartan™ Tree Transplanting Equipment Company, 16084 S. Chandler Rd., East Lansing, Michigan 48823. Phone 517 351-1370. (We buy, sell, and repair high quality tree transplanting equipment).

FOR SALE: Two Ryan 18" sod cutters, automatic cut off, $600.00 each. Two 18" sod rollers, good working condition, $250.00 each. One Rainmaster 6x6 irrigation pump with Ford V-8 391 industrial engine, $2,500.00. Mueller Farms, Inc., Huntley, Illinois, 815 923-4368 days. 312 669-5794 nights.

FOR SALE: 1968 945 Wayne 4 wheel sweeper. Perkins diesel power, good condition. Phone 303 934-8320.

ROYER TOPSOIL SHREDDER, brand new, used three weeks, extra gas can, two hitches. Call after 9:00 p.m. 216 237-3668.

FOR SALE: Brouwer 16" harvester with Massey tractor, very good condition, asking $10,000; Del Zotto 28" front mounted tree transplanter, new, $3,000. Tom Selstad, Selstad Soil Service, R1 West, Box 43, Great Falls, Montana 59401. 406 452-5158.

MODEL 329 EVERSMAN land leveler, excellent condition. Large turf vac with hi-lift dumping. Crystal Springs Sod Farm, R1, Worthington, Pa. 16262. 412 445-3338.

USED CHIPPERS, SKYWORKERS and hydro-ax's. Please call P. C. Gould Sales Company, Box 178, Essex, Connecticut 06426. 203 767-1636 Phil or Jeff Gould.

FOR SALE: 4 Elliott Hi-reach — No. 21, 45 ft. aerial tower mounted on 1973 1½T Chevy. truck, $3,500.00. No. 22, 50 ft. aerial tower mounted on 1973 C-60 Chevy. truck, rotating bucket, $23,660.00. No. 32, 50 ft. aerial tower mounted on 1969 Ford

For ad on following page circle 131 on free information card

truck F-600, $16,500.00. No. 41, 50 ft. aerial tower mounted on 1973 Chevy. truck C-60, rotating bucket, $21,700.00. Vermeer stump cutter, model 2460, 1969, 60 horsepower engine, $4,550.00. Swingle, Inc., 620 South Dahlia Street, Denver, Colo. 80222. 303 399-2301.

VERMEER MODEL 2460 stump grinder. $5,200.00. Wye Tree Experts, Inc., Wye Mills, Md. 21679. Phone: 301 822-3220.

USED VERMEER tree spade TS44 mounted on 4 wheel drive. GMC 2 ton, $7,700.00, very good. 618-682-3363; 618 682-3370.

TREE SERVICE EQUIPMENT — 4 chippers, 4 aerial bucket trucks, 2 crew trucks. John Mayer, 300 Muir Mill Road, Willits, Calif. 95490. Phone 707 459-2013.

FOR SALE — Worthington turf mowing tractor with five gang Blitzer. Kansas City area. Call 816 421-6632.

STUMP ROUTER — Wayne Stump King, good condition with water cooled engine. $2,400.00. Call 215 539-6090.

1974 JOHN BEAN SPRAYER model B-6-50MT, 600 gallon stainless steel tank, 50 gpm. at 800 psi, 200' ¾" hose. 802 658-2433 or 4 Seasons Garden Center, Williston, Vermont 05495.

VERMEER STUMP CUTTER, model 6524, $5,000.00. Asplundh 16" chipper, $4,500.00. Both A-1 shape. Joe Little Tree Service, 3746 S. Jamestown, Tulsa Oklahoma. 918 743-8434.

SEEDS

SOD QUALITY Seeds: Adelphi, Glade, Cheri, Nugget, Merion, Fylking, Majestic, Baron & Touchdown bluegrasses, also fine fescues. Manhattan ryegrass. Custom mixing available. Michigan State Seed, Grand Ledge, Michigan 48837. Phone 517 627-2164.

MISCELLANEOUS

WE DIG TREES. Will move large trees (5" to 10") with 78" tree spade. Will travel. Call or write Floral City Tree Service, 891 N. Dixie Hwy., Monroe, Michigan 48161. 313 241-7510.

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WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. McKay Golf & Country Club Properties, 15553 N. East St., Lansing, Michigan 48906. Phone 517 484-7726.

LEARN LANDSCAPING and the Growing of Plants at home. Start a satisfying business or hobby. Free booklet. Lifetime Career Schools, Dept. A-399, 2251 Barry Avenue, Los Angeles, Ca. 90064.

WANTED TO BUY

LINDIG OR ROYER SHREADERS. Any size age or condition. Art Lewis 813 299-2106, 355 5th Street. S.W., Winter Haven, Florida 33880.

AAA TREE SERVICE, INC. is interested in buying all types of used tree equipment. 1292 South Eastlake, Longwood, Florida 32750. Phone 305 339-5242.

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WT&T

EVENTS

American Association of Botanical Gardens and Arboreta Annual Meeting, Royal Botanical Gardens, McMaster University, Hamilton, Ontario, Canada. May 28-June 1. Leslie Laking, Royal Botanical Gardens, Box 399, Hamilton, Ontario, Canada L8N 3H8.

Canadian Land Reclamation Association Third Annual General Meeting, Sudbury, Ontario, Canada, May 29-June 1, Canadian Land Reclamation Association, Box 682, Guelph, Ontario, Canada N1H 6L3.

Va. Society of Landscape Designers/Va. Nurserymen's Association Joint Summer Meeting, Cavalier Hotel, Virginia Beach, Va., June 3-5, John Richardson, VSLD, 9540 W. Broad St., Richmond, Va. 23229.

1978 Rutgers Turfgrass Research Day, Ryders Lane Turf Station, North Brunswick, N.J., June 7, 201/932-9427.

Annual Management Seminar for Commercial Arborists, Baltimore, Md., June 13-14, 516/221-3082.

103rd American Association of Nurserymen Convention, Fairmont Hotel, New Orleans, La. July 15-19. American Association of Nurserymen, Inc., 230 Southern Bldg., 15th and H Streets, NW, Washington, D.C. 20005. 202/737-4060.

American Sod Producers Association Summer Convention & Field Days, Sheraton-Spokane, Spokane, Wash., July 19-21, 402/463-5691.

Annual Management Seminar for Commercial Arborists, Denver, Colo., June 20-21, 516/221-3082.

Lofts Field Day, Lofts Research Plots, Martinsville, N.J., June 21, Karna Sapp, 201/359-1100.

Missouri Turf Field Day, University of Missouri South Farms, Columbia, Mo., July 25, 314/882-7838.

1978 Penn Allied Nursery Trade Show, Hershey Motor Lodge and Convention Center, Hershey, Pa., July 25-27, 717/243-1786.

The South Carolina Plant Food Educational Society Annual Summer Meeting, Holiday Inn, Hilton Head, S.C., July 30-Aug. 1, A. B. Everett, Sec.-Treas., TSCPFES, 615 Saluda Ave., Columbia, S.C. 29205.

ALCA Reclamation/Erosion Control Symposium, Marriott Hotel, Denver, Colo., Aug. 3-4, 703/893-5440.

American Association of Nurserymen 1978 Management Seminar, Colorado State University, Fort Collins, Colo., Aug. 13-18, 202/737-4060.

Tenth Biennial National Christmas Tree Convention, Amherst, Mass. August 16-18. National Christmas Tree Assoc., 611 E. Wells St., Milwaukee, Wisc. 53202.

Turf and Landscape Day, Ohio Agricultural Development and Research Center, Wooster, Ohio, Sept. 12, 216/264-1021.

International Pesticide Applicators Association Annual Convention, Sea-Tac Motor Inn, 18740 Pacific Highway South, Seattle, Wash., Sept. 13-15, Ed Walters, 206/362-9100.

Pacific Horticultural Trade Show, Anaheim Convention Center, Anaheim, Ca., Sept. 20-22, 916/443-7373.

1978 Northwest Turfgrass Conference, Holiday Inn, Richland, Wash., Sept. 25-28, Dr. Roy Goss, Western Washington Research and Extension Center, Puyallup, Wash. 98371.

18th Annual Turfgrass Equipment & Materials Educational Exposition, Orange County Fairgrounds, Costa Mesa, Cal., Oct. 18-19, 213/798-1715.

WT&T

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ORTHENE is registered for gypsy moth larvae, bagworms, spring and fall cankerworms on trees and shrubs, California oak moth larvae on oak trees, thrips and aphids on labeled floral crops.

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For more information about this remarkable chemical please fill out and mail us the attached coupon.

Avoid accidents: For safety, read the entire label including cautions and warnings. Use all chemicals only as directed.

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TM's: ORTHO, CHEVRON, CHEVRON DESIGN, ORTHENE — REG. U.S. PAT. AND T.M. OFF.

"When we include baron* in our bluegrass mixture, we know we can depend on the results."

That's what George Koziarz of Synnestvedt Landscape, Architects and Contractors has to say about baron.

The Synnestvedt operation serves the North Shore of Chicago and is based on a design-build concept. The backbone of the company. . .landscape architecture and contracting. . .is supported by a 300 acre nursery, a fully-equipped tree care division, a commercial landscape maintenance division and two rapidly growing garden centers.

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"Since we began using BARON there are fewer problems. That means fewer call-backs. . .BARON seems to be much more dependable."

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If you're a landscape contractor, sod grower or golf superintendent, top quality turf is important to you. Lofts is ready to help with BARON, Majestic or Touchdown Kentucky Bluegrasses, Jamestown Chewings Fescue, Yorktown and Diplomat Perennial Ryegrasses, as well as other varieties.

*U.S. Plant Patent #3186, Dwarf Variety

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